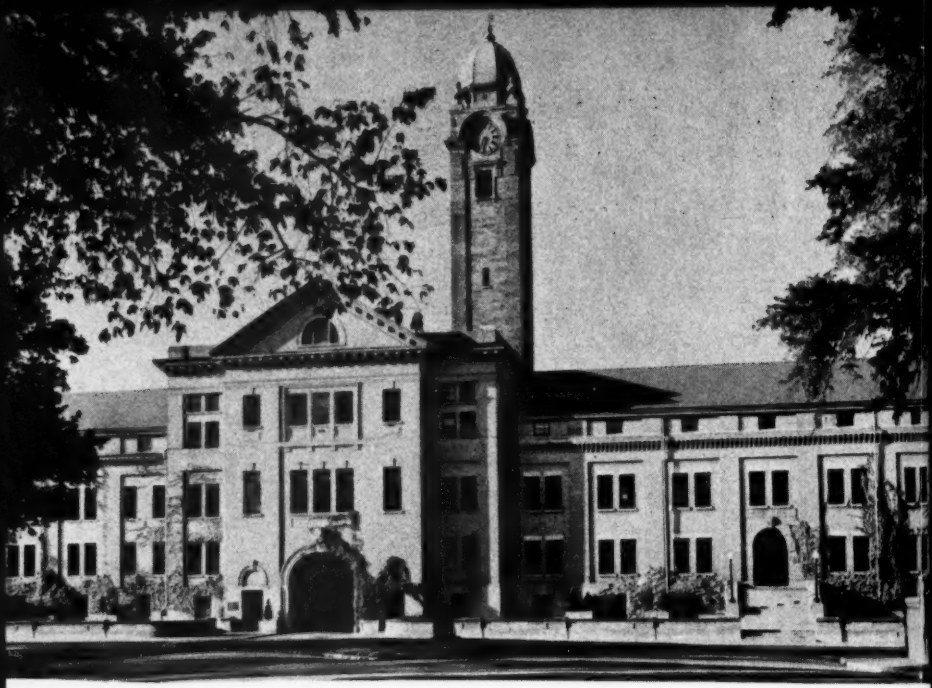
MILITARY REVIEW

RECEIVED
7 SEP
ARMY LIBRARY
SERIAL RECORD

COMMAND AND GENERAL STAFF COLLEGE
FORT LEAVENWORTH, KANSAS

OCTOBER 1955 VOLUME XXXV NUMBER 7



COMMAND AND GENERAL STAFF COLLEGE

COMMANDANT
MAJOR GENERAL G. H. DAVIDSON

ASSISTANT COMMANDANT
BRIGADIER GENERAL W. F. TRAIN

EXECUTIVE FOR INSTRUCTION
COLONEL W. W. CULP, *Armor*

EXECUTIVE FOR RESEARCH AND EVALUATION
COLONEL S. L. WELD, JR., *Artillery*

SECRETARY
COLONEL JOHN F. FRANKLIN, JR., *Armor*

DEPUTY POST COMMANDER
COLONEL C. P. ROBBINS, *Armor*

MILITARY REVIEW

VOLUME XXXV OCTOBER 1955 NUMBER 7

CONTENTS

GLOBALITY AND LAND FORCES 3
Lieutenant Colonel Anthony L. Wermuth, General Staff

MILITARY FORCES AND NATIONAL OBJECTIVES 12
Major Charles M. Fergusson, Jr., Armor

CIVIL ASSISTANCE IN ACTION 30
Colonel James E. Mrazek, Infantry

WHERE WILL IT HURT THE "MOST"? 37
Lieutenant Colonel Marshall H. Armor, Jr., Artillery

VERBAL DEFENSE 45
Colonel Henry E. Kelly, United States Army, Retired

ARE WE FLYING TOWARD STRATEGIC DISASTER? 53
Major James A. Huston, United States Army Reserve

MILITARY NOTES AROUND THE WORLD 65

FOREIGN MILITARY DIGESTS 75

The Geopolitical Basis of Modern War 75

Electronic Countermeasures as a Weapon of War 83

Soviet Naval Strategy 87

Panzer Divisions 91

The Development of Area Defense in Jungle Warfare 97

Atomic Warfare and the Infantry Division 101

BOOKS OF INTEREST TO THE MILITARY READER 111

This copy is not for sale. It is intended for more than one reader.
PLEASE READ IT AND PASS IT ALONG

MILITARY REVIEW STAFF

EDITOR IN CHIEF

LIEUTENANT COLONEL WILLIAM D. MCDOWELL

NORTH AMERICAN EDITION

Editor: LIEUTENANT COLONEL CHARLES A. CHRISTIN, JR.

Assistant Editor: MAJOR JOHN J. EARLEY

SPANISH-AMERICAN EDITION

Editor: MAJOR GILBERTO GONZÁLEZ-JULIÁ

Assistant Editors: MAJOR TOMÁS H. GUFFAIN, CAPTAIN ANTONIO V. MUNERA

CAPTAIN ORLANDO ORTIZ MORENO

BRAZILIAN EDITION

Editor: LIEUTENANT COLONEL HERMANN BERGQVIST

Assistant Editor: LIEUTENANT COLONEL TÁCITO T. G. DE OLIVEIRA

Administrative Officer

MAJOR LINO BONUCCI

Production Officer

MAJOR JAMES A. TRENT

The printing of this publication has been approved by the Director of the Bureau of the Budget 2 July 1953.

MILITARY REVIEW—Published monthly by the Command and General Staff College at Fort Leavenworth, Kansas, in the English, Spanish, and Portuguese languages. Entered as second-class matter August 31, 1934, at the Post Office at Fort Leavenworth, Kansas, under the Act of March 3, 1879. Subscription rates: $3.50 (United States currency) a year in the United States and other countries of the Western Hemisphere: $4.50 a year in all other countries. Individual reprints, except for copyrighted material, are authorized, provided credit is given the MILITARY REVIEW, Command and General Staff College, Fort Leavenworth, Kansas.

GLOBALITY AND LAND FORCES

Lieutenant Colonel Anthony L. Wermuth, *General Staff*
Assistant Secretary General Staff, Office of the Chief of Staff, Department of the Army

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

THE airplane as a weapon is probably at the peak of its great power; it may be past its peak. The end of the airplane's role as a weapon will not arrive for several years, perhaps not for a decade or two; but the end inexorably approaches and takes shape; nor can the end be forestalled by terminology, by attempting to semanticize its replacement, the missile, as a "pilotless aircraft." In the historical sense of weapon nomenclature, it would have been infinitely more appropriate to term the weapon-aircraft, during its temporary appearance in history, "piloted artillery." There appears to be about as much propriety in calling missiles "pilotless aircraft" as in calling commercial airliners "bombless aircraft," calling greyhounds "riderless dogs," or calling infantrymen "aircraftless men." The eventual missile will be less many things besides a pilot.

During the long history of lethal wars and battles—which is in a partial sense the history of man—the intervals between wars have also served as periods of battle, during which, among other conflicts, the battles of military theory have been fought. During the past few decades innumerable developments, of which the development of the medium of air is one, have intensified the scale and complexity of both military operations and military theorizing. This personal essay, which bears witness perhaps more to the continuity than the complexity of military theorizing, is intended merely to attempt a simplified examination, from a groundling's view, of several aspects of widespread warfare, including military use of the air.

Among various persistent views still being repeated enthusiastically is one which had been advanced for years prior to the advent of nuclear weapons, *viz.*, the general assertion that air forces could destroy a nation's war-sustaining economy, thus rendering surface sea forces obsolete and ground forces moribund. Insofar as there lies smoldering in this assertion an implication that the job can be done by unlimited dropping of bombs, I consider the assertion not worth much discussion. *Unlimited* exploitation of any "big-bang" weapon, however delivered, would undoubtedly accomplish the job; but an unlimited exploiter would not need airplanes at all. The validity of the assertion is contingent upon success despite limitations, and despite any and all countermeasures an enemy can bring to bear against bomb-dropping on its important

To whatever extent the airplane is capable of aiding the fighting man to gain control of land and people, with weapons or transportation or both, it contributes its maximum effect to total military power

targets. This assertion has remained unproved to date despite numerous opportunities with many thousands of tons of conventional bombs and two atom bombs.

The advent of nuclear weapons was an unexpected gratuity which gave an enormous renewal of life to the assertion, resulting in its extension into its current form, a Siamese twin thesis that air forces and nuclear weapons have made war both global and total.

This is an interesting double play which certainly merits examination in its own right. Even more deserving of examination is the triple play on which it is based, that is, an attempted equation of the three media of land, sea, and air as conferring, not only generally equal capabilities on users of the media, but also certain unique and somehow superior capabilities on users of the air medium, particularly air forces.

There is nothing which links globality and totality in exclusive adherence either to each other or to air forces except statement. The two qualities are in fact quite separable. One concerns primarily area; the other, degree. In considering totality it can be easily shown that there is nothing new in the concept of total war. After Cato's repeated warnings to the Roman Senate 2,000 years ago that "Carthage must be destroyed," Carthage was destroyed. In fact Carthage disappeared—its destruction could not have been "more total." While total destruction has not been practiced in modern wars, totality was certainly not born simultaneously with the airplane. The *possible* totality which characterizes future war as envisioned today is linked directly to the results of the nuclear explosion and its fearful power to destroy. Whether delivered by gun, airplane, missile, submarine, or satchel it is the nuclear explosion, not the delivery means, which is responsible for totality of destruction. The capability to deliver nuclear explosions is not today, nor will it be in the future, the exclusive capability of air forces.

Globality is a concept with much more complex ramifications than totality, and more of this essay's attention will be devoted to it. "Globality" is of course only a relative or figurative term, especially the alleged globality of war; for no shooting war can be foreseen which would be global in the sense of simultaneously embroiling all areas of the globe. Any scale of war that can be foreseen will still amount to a concentration of war in certain limited geographical areas, only larger perhaps than the geographical areas involved in previous wars. The term "globality" applied to military operations means merely that the area of military operations in war continues to expand. As with totality, globality is neither the creation nor the monopoly of forces which operate in the medium of air; it is no more attributable exclusively, or even preponderantly, to a machine that flies than it is attributable to the railroad, to the ship, to the modern industrial complex, or, most especially and significantly, to communications. For example, modern "global" air operations, particularly in war, would be, as a practical matter, all but impossible without electric and electronic communications. Without the combined operation of a host of significant other factors, the "global" capability of the airplane would be negligible. Un-

---

Lieutenant Colonel Anthony L. Wermuth has been a frequent contributor to the MILITARY REVIEW. *His "The Split Infinitive Is Here to Stay" appeared in the September 1955 issue. A graduate of the United States Military Academy in 1940 his military service includes duty as battalion commander and G3 of the Southern Landing Force on Kiska Island; instructor and assistant professor of English at West Point; and duty with Headquarters, USAREUR, and Headquarters, European Command. He is presently assigned as Assistant Secretary General Staff, Office of the Chief of Staff, Department of the Army.*

questionably, the airplane has contributed to the expansion of war over greater areas, but it did not invent the expansion.

As I suggested earlier, much of the extreme theorizing about air force roles and capabilities must stem from basic convictions that the three media of land, sea, and air are separable conceptual entities; that the three media possess inherent general characteristics which enable the users of the media to perform different, but equally important, actions; and that such advantages as are inherent in any one medium favor air which it is said exposes the entire structure of a nation. This equation is a gross error. Awkward as it may be to compare air and land, even a superficial analysis such as the following one underlines the inferiority of air to land as a medium for man's use. It takes no great perspicacity to discover the fallacy which should be obvious and familiar. Yet, it seems to me, judging by what is said today about air forces, that the elementary comparisons which follow have not been thought of for years.

Air is a gas and is so obviously unable to compete with solids or liquids as a supporting medium that expressing the contrast seems an exercise in platitudes. Since man himself is a solid object (as solid objects go), and since all the means by which man performs almost every human action but breathing are solid or liquid, the comparative deficiency in air's ability to support weight is a fundamental limitation to anything which attempts to be supported in air. Generally speaking, and even then only under carefully developed artificial conditions, movement in air is necessary in order to be supported in air; hence whatever energy is available to a user of the air medium must be overwhelmingly devoted to the purpose of support. Even breathing has limitations in the air medium; natural breathing is possible only in proximity to the surface of the earth.

Relative Advantages

Air has one great relative advantage over the media of land and sea; its low density permits far greater speed to objects (not limited to piloted aircraft) moving through it. In turn, greater speed permits greater range within a given period of time. Note that it does not permit greater range—only greater range within a given period of time than is possible on land or sea. These two are the great advantages of the air medium, and probably the only advantages which will remain indefinitely characteristic of users of the medium. Speed itself, of course, carries attendant disadvantages in certain situations; for example, the faster an object moves, the less maneuverable it is; the faster a man moves, the less he can observe.

A lesser relative advantage of exploiting the air medium is the ability to observe a wider area than is normally observable from the earth's surface. The physical effectiveness of the human eye is not improved by lifting it to, say, 10,000 feet; the eye at that height can itself see no more and no farther than it can on the ground, except as it is permitted to see beyond physical objects which would otherwise mask observation. On the other hand, in certain situations, observation may be decreased, not increased, by observing from increased altitude; one may desire detailed observation, for example, which improves only with proximity, not distance. Again, the speed of modern aircraft may and does limit human observation drastically.

Another relative advantage of the air medium is vertical approachability to targets located on the earth's surface, by which, generally, the most vulnerable aspect of objects, their upper surface, can be approached by destructive devices utilizing all of the advantages of gravity. Moving through the air one can quickly pass over objects that impede progress

on the ground. This may be, however, a disadvantage when one desires to get close to, or on, terrain features whose nature prevents the close approach of airplanes. Nevertheless, the approachability from above which is peculiar to the air medium, including but not limited to piloted aircraft, is a relative advantage of considerable proportions at this stage of weapons. Again, however, it should be noted that vertical approachability was not invented by the flying machine. It was generated back in the dawn of history when the first man arched a stone so that it fell on his enemy from above. Since that modest trajectory, the capability has been expanded continuously, reaching its full incorporation in weapons in the development of all types of artillery. There is a legitimate sense in which the piloted aircraft, as a weapon, and despite its formidable powers as an individual weapon today, is merely an interim form of artillery.

Relative Disadvantages

Contrasting with the foregoing relative advantages, there are other characteristics inherent in the medium of air which are relatively disadvantageous to whoever and whatever attempts to use the air. First and foremost is the inability of man to sustain himself or support himself in air without enormous special measures which are costly in effort, energy, and resources; which are dependent upon mechanical means; and which, at best, are of temporary duration. It becomes obscured in the fog of argument that what goes up must come down; that the flying machine is a land-based, not air-based, vehicle; that the airplane must take off from land and return to land, and in most instances to patches of carefully prepared land with very special characteristics; that both man and machine are dependent upon sustenance and repair available only on land; and that large air forces are voracious consumers which, while not dependent upon difficult to build and maintain complexes of surface highways and railroads in forward areas, are eventually as dependent as surface forces on the heavy-tonnage lines of communication which are only possible of establishment on land and sea. While in the air, man and his machine are dependent upon a single form of communication: electronic, a form which is itself not free of limitations.

Airmen are fond of citing the boundaries of land and sea. There is also one great boundary to the earth's air space, that is, the surface of the earth itself. Despite swift advances in coping with weather, the flying machine is still relatively limited by simple darkness and by degrees of bad weather which are no hindrance to operations on the ground. The accuracy possible from a moving platform will always be inferior to that possible from a stationary platform. The flying machine cannot remain stationary; it must move in order to stay in the air at all.

Control

There are other disadvantageous characteristics, but I would prefer to concentrate on one insurmountable disadvantage: there are simply not many things that man can do, even with his machines, while he is in the air. There are even fewer things that a man, or a man and a machine, in the air can do to a man on the ground. What can a man do in the air? Generally, only elementary actions such as thinking, reading, sleeping, talking, and eating—and these only to a limited degree; for the major portion of his attention must be devoted to the demanding and essential business of staying in the air. He cannot perform the infinite variety of activities possible to man in his natural element, on the ground. He cannot build anything. He cannot conduct important or complex affairs. He cannot control—and

this is particularly interesting in view of some airmen's convictions that air operations are beyond the possibility of understanding by groundlings—even large-scale air operations.

Naturally, the successive events of a great air operation, as they are communicated to an air force commander on the ground, filter through a mind (his) which is conditioned by previous valuable experience in air situations. However, he cannot set up in the air nearly adequate facilities for planning, intelligence analysis, or operational control of wideflung combat and logistic actions. Only on the ground can he control operations over a wide area because only on the ground can he set up control means on an adequate scale. There is nothing peculiar to air forces about this limitation; it is common to all large-scale operations. It does not matter in air or surface operations where the commander is physically located so long as he is in the proximity of the only means by which he can exercise control —2-way communications. It takes many people and many communications facilities to provide the indispensable assistance by which large-scale operations can be controlled in any medium; and it is feasible to set up such facilities only on the land or on the sea.

Destruction

What can a man in an airplane do to a man on the surface? He can do one powerfully influential thing in human affairs: provided he can hit him, he can destroy him. Provided he can find the correct target (a difficult feat, from the air) on the surface, and provided he can then hit the target (another difficult feat from the air), he can destroy it. It is not necessary to disparage the destructive capabilities of surface forces in order to recognize fully the great capability for destruction which the medium of air makes possible for air forces to apply. However, the capability for destruction is about the limit of versatility possible for weapons to apply from the air. They can threaten destruction and they can drop destruction.

In the affairs of men, even in battles and wars, destruction is not the form of force which it is invariably desirable to apply. Land and sea forces, particularly land forces, have the capability of applying innumerable variations of force which are more appropriate to the countless situations which occur, from total destruction all the way down the spectrum of force to "bringing them back alive." In this sense airpower is a relatively inflexible form of power. It cannot make discriminations. It can only withhold or apply destruction. Against man properly secured under the ground, airpower can do almost nothing.

Transportation

To advance at this point a subtotal of what has been said so far concerning the medium of air, its advantages, its limitations, and the airplane, I would like to suggest that the fundamental role of the airplane is to provide fast transportation, to transport men, weapons, and material of limited size and weight from one point on land to another point on land. There is not much point in merely being in the air except as a temporary diversion or escape from mundane cares; and to live in the air is, of course, impossible. So long as passengers ride in aircraft there would seem to be no reason why a pilot should not go along. In any event the important consideration will continue to be that man wants to get from one point on the ground to another point on the ground so that the business of man's life can be continued. For those who want to travel by the fastest possible means, flying through the air will always be the obvious choice. When weapons moving through the air to great ranges no longer need men to accompany them in order to

operate them and to guide them, the weapons role of piloted aircraft will atrophy like the manually operated telephone exchange.

As far as the medium of the sea is concerned, I believe it is unnecessary in this discussion to dwell upon its characteristics at great length; but a few of its advantages and disadvantages might well be mentioned in passing. Water with some assistance can support heavy weight fairly well. There is even a certain amount of food in the sea. The seas, covering five-sixths of the earth's surface, provided a global capability for ships centuries before airplanes left the ground. The sea has a unique characteristic by which movement is possible under the surface. Moreover, it is on the surface of seas, and only on the surface of seas, that it is possible to move heavy tonnage from one land mass to another. Ships too are based on land and must return to land, but the ship's tenure in its special medium is many times the tenure of the airplane in its special medium. Generally speaking the sea's characteristics approach much more closely those of land than do those of air.

Land, the Primary Medium

Reversing the immutable order of man's introduction to these three media, we come at last to land. When we reach land, we reach home. Beyond question, for man, land is the primary medium. Land is his natural medium, in which he needs no artificial means to feed himself, or support himself, or move himself. He need never leave the land.

Land covers one-sixth of the earth's surface but is not confined to a geographical sixth. Land is widely scattered all over the globe. With the help of sea transport, man has a global capability on land, and has had it since the dawn of man's presence on the globe. Even without the help of sea transport, he has had a "global" capability on land, considering the extent of the earth's land masses, and considering that "globality" really means only wide-ranging capability.

The means of life are located on land. The infinite variety of human activity can be accomplished only on land. Practically all the works of man are located only on land and are possible of location only on land—his nurseries, his churches and temples, his homes, his schools and universities, his clubs, his sports, his factories and spinning wheels, his courts, his communications centers, his hospitals, his farms, his tobacco, his printing presses, his pygmy and giant industries, his governments, and his cemeteries—all the institutions and things which are identifiable with man and which are worth anything to man. Of special military interest is the fact that the only things of military value which are not located on land are sea forces when they are at sea and air forces during the minor portion of time when they are in the air. On the other hand, land holds all the bases for land forces, for sea forces, and air forces. Without their land bases, neither land, sea, nor air forces would be able to operate. On land are all the ammunition factories, shipyards, and aircraft-manufacturing plants, and, except for limited control elements possible of establishment on large ships, all the major control centers and headquarters for land, sea, and air forces. In other words the sources of power, of national power, and of military power, are all on land. In sum, all material power in the affairs of men is landpower or an extension of landpower.

Finally, and pre-eminently, man himself is located on land. Nations are primarily groupings of people. Nations and land areas, that is to say material power and its forms and sources, can only be controlled by controlling people, the people who live on the land and directly control power on land. In order to control people,

one must go to where people are, to the land where they live and maintain their sources and forms of power. In war, in order to take from an enemy control of his power, it is necessary to destroy or neutralize or remove the sources of his power, if one can. In order to do that it is in most instances necessary to destroy or neutralize or otherwise control him. In the end, you may well have to destroy him. If so, it is possible to destroy him with land, sea, or airpower. If you want to do anything other than destroy him, you will, in overwhelming probability, have to meet and fight him on the ground.

Considering the nature of land, the nature of land forces, and their relationship to man and his sources of power, the centuries-old thesis can be supported today and indefinitely into the future that in land forces, the only forces that can actually maintain control of land, lies the preponderant element of military power, and that only insofar as land forces are advanced is decisive control of opposing military power possible. All forms of military power in fact are launched from land; all are aimed at land; and, at least in the "global" sense, all are controlled from land. This is not to fail to recognize that major and bloody battles are fought at sea and in the air, but they are not fought for control of the sea and control of the air for their own sakes, but only for the decisive purpose of contributing, through control of the sea and the air, to the control of the power which is on land. It is in the nature of things that control of anything is not enhanced by distance. To influence control of land, one must normally be able to get close to land. Military control of land is therefore primarily and immediately the capability and function of the forces which are already on land: land forces.

It is at least questionable to insist that military power is divisible into three portions, each an entity. The only entities in the forms of military power are subsidiary ones, specifically, those limited operations in which forces operate independently in one medium, and those are never really "independent." Air and sea are contiguous to land and to each other. Military power, as its forms maneuver in one or two or all three media at one time, changing its composition and maneuvers to fit the changing situations, is essentially indivisible. It is only weak or strong. In particular situations it is more sensibly divided into types of military operations and into geographical areas than into the media in which its various machines may temporarily operate. There is only one entity in military power, and that is military power itself. Its success is geared to its success in the control of land.

In this connection one may observe that big fallacies give birth to little fallacies. One of the little fallacies fathered by the big one in the preceding paragraph is this: "Assignment of control of forces at any level other than that which is able to exploit fully their weapons is contrary to accepted military doctrine." I do not know how wide is the "acceptance" of that particular doctrine, but it cannot be very wide. It seems to me more important that a commander, if he must choose, should give more weight to what his mission requires to be done than to the maximum capabilities of his means. Naturally he is not going to assign a *B-52* to drop grenades on a deployed armored division (it could not anyway, nor is it designed to); but the doctrine quoted above seems to me to be tantamount to saying that it is more important, for example, for a community powerplant with a 20,000-kilowatt capacity to be used only when 20,000 kilowatts are required than to give continuous service to a community which normally uses only 10,000 kilowatts but may need 20,000 in special circumstances.

They will have to take 20,000 or none.

Considering that ships have had a "global" capability for centuries, and that all airplanes can now fly around the world by one route or another, the quoted doctrine would preclude the assignment of any ship or plane to a geographical theater of operations, even if the theater included all of Europe or all of Asia. Fortunately for stockholders in commercial airlines, commercial planes with a global capability are content to perform modest tasks when their mission requires them. One can fly regularly in 4-engine aircraft between Philadelphia and New York, a distance of only 90 miles, which a barefoot contessa can cover in one day on a bicycle.

Unprepossessing as the word may be, I would like to return to the concept of globality, especially its relation to land forces—or, rather, not to put too fine a point on it, its relation to the Army. It is always fascinating, in a limited way, to listen to airmen contrast the wide, blue, global capability of air forces with "the battlefield" to which ground operations are "limited," as if "the battlefield" were about postage stamp size when looked down upon from 15,000 feet. Unfortunately, some Army commanders have also tended to endorse thinking of the Army's appropriate scope of operations as extending a limited distance over the horizon. Not top Army commanders, of course; Marshall, MacArthur, and Eisenhower have no lessons to learn from anyone about grasping strategy on any scale.

As I pointed out (or perhaps merely "asserted") earlier, the first forces to develop a global capability were, of course, land forces. The area of operations of Genghis Khan, Caesar, and Attila would tax any kind of military forces even today. Almost 200 years ago in our own little Revolutionary War, land operations ranged from Canada to Georgia. Over 100 years ago, 70 years before the sun rose on the Wright brothers at Kitty Hawk, Daniel Webster described in a speech:

A power which has dotted over the surface of the whole globe with her possessions and military posts, whose morning drumbeat, following the sun, and keeping company with the hours, circles the earth with one continuous and unbroken strain of the martial airs of England.

Today after the tremendous scope of World War II conflict the United States has succeeded England, if not with empire, at least with influence. This very day the Army is carrying out what are obviously global interests. Exclusive of attachés, there are United States Army personnel in over 40 foreign countries, from missions to field armies. So long as land forces or any other forces are deployed or can be deployed globally, the Army will have a global capability. As the scope and area of military operations increase (if they do), the Army must think more and more globally than it has tended to in the past, in order to contribute more effectively the thinking of the prime element of total United States military power.

For example, consider the so-called "heartland" targets. Airmen have somehow contrived to stake out heartland targets as the exclusive interest of air forces, from selection to delivery. I am unable to account for the qualifications of airmen which have led to their being permitted such a role. The airman possesses one special area of unique competence: the fighting of air forces by air forces in the air. Giving him any sole interest in any other aspect of military operations is about as logical as permitting the jockey, not other jockeys or the trainer or owner or club steward or track owner or race commissioner, to decide what races a horse may enter, how the races will be run, and what prizes will be awarded. If destruction of a petroleum center 1,000 miles away will reduce the enemy's ability to throw

land or sea or air forces against our own forces, especially land forces, now or next year, that petroleum center is of 100 percent interest to the Army, no matter what delivery means is used to carry destruction to it. For that matter it is also of considerable interest to a few nonmilitary agencies of government who have no forces at all.

The medium of air permits the airplane to perform redoubtable contributions at this stage of development as a special weapon of military power. Its special strength is its ability to carry not only weapons but fighting men farther and faster in a shorter time than by any other means. To whatever extent it is capable of aiding the fighting man to gain control of land and people, either with weapons or with transportation or with both, the airplane contributes its maximum effect to total military power. On the other hand, the airplane and the medium in which it operates have profound inherent deficiences which are embarrassing to claims of dominance and omnipotence and autonomy.

The speed, dramatic grace, and comparative novelty of the airplane (not to mention the noise and the propaganda) have rushed us into a kind of illusion that we live in the Air Age. We do, in a limited sense. We also live in the Electronic Age, the Nuclear Age, the Age of Juvenile Delinquency, the Age of Individual Freedom, the Television Age, the Age of Medical Progress, the Billion Dollar Age, and many other Ages. Which of these terms is most characteristic or most significant? Who would dare to say? Are they more significant than such equally applicable terms as the Railroad Age, the Age of Shipping, the Electric Age, the Automobile Age, and other more familiarly termed Ages? Has man undergone such a metamorphosis that he can no longer be intelligently considered to still live in the same old familiar Land Age? Or has the soldier, with tanks, submarines, supersonic interceptors, shaped charges, and other diabolic technical innovations, been swallowed up in an Age of the Fighting Machine, having outlived the Age of the Fighting Man?

In any attempt to look to the future and to prepare for the tests of the future, the need for a strong Army and the importance of ground warfare remain as great as they ever were. In fact, the advent of new weapons and the increased importance of airpower have but given new meaning and wider scope to the dimensions of land warfare, without changing war's nature and basic objectives.

As we proceed through this period of profound military change, it is well to recall these fundamentals, lest we lose our military bearings. Warfare is an armed struggle between organized groups of men, each seeking to impose its will on the other. The ultimate objective of the entire effort is control of land and of people living on land. It takes land forces to establish those controls, which these forces do through their vital contribution to the winning of military victory. It takes these same forces to maintain those controls.

General Matthew B. Ridgway

MILITARY FORCES AND NATIONAL OBJECTIVES

Major Charles M. Fergusson, Jr., *Armor*
Headquarters, Allied Land Forces Southeastern Europe, Izmir, Turkey

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

NATIONS have many ways of accomplishing the things they want done—many means of seeking their objectives. These means have been called tools and techniques, instruments, or weapons by various observers, and have often—for purposes of analysis—been subdivided into political, economic, military, and psychological categories.

This article is concerned with military force and its relationship to the attainment of United States national objectives. These objectives will be assumed to include such broad goals as peace, security, higher standards of living, civil freedoms, increased world trade, and expansion of democratic institutions.

That military force does contribute to such national objectives is generally assumed. This assumption underlies the great public debate over the concepts of "massive retaliation," the "new look," and other aspects of United States military policy, as initiated by Secretary Dulles' statement of 12 January 1954. This public debate has clarified many of the issues involved, but there still remains a great deal of confusion in both military and civilian circles as to the possible contributions of military force and the forces necessary to make these contributions reasonably attainable.

The purpose of this article is not to suggest the specific military force that should be committed under any given set of circumstances. The purpose is a more modest one of examining briefly some of the various capabilities of military force, some of its limitations, and of suggesting some implications for military policy based upon these capabilities and limitations.

I. Military Capabilities

The capabilities of military force in supporting national policy will be discussed under the following major headings: offensive war capability, defense capability, deterrent capability, and other capabilities.

Offensive War Capability

Since time immemorial states have frequently waged offensive war against their unfortunate neighbors. States have resorted to the overt use of military force for political, economic, and other advantages that are often obscure. Particularly during the nineteenth century, the United States herself was not unwilling to employ military force in this manner as evidenced by the War of 1812, the Mexican War, the Indian wars, and, most particularly, the Spanish-American War. Incidentally, all of these were quite limited operations.

It cannot be denied that many aggressive wars have paid handsome dividends to the

aggressors. Most nations, including the United States, owe their independence to the overt use of military force. Many have expanded their territory and increased their wealth through force of arms. The United States expanded to the West—and elsewhere—at the expense of the Indians, the Spanish, and the Mexicans. Thus it seems accurate to conclude that—at least under certain circumstances in the past—military force used overtly has provided an effective means of seeking state objectives. Recent history marked by World Wars I and II and the Korean conflict indicates conclusively that the day of overt use of military force is not over. It also indicates a rather consistently dismal series of failures for the aggressors. There are probably many reasons for these failures. Any overt application has tended to unify the defenders and stimulate their greatest efforts. Acts of aggression have tended also to alienate neutrals and former allies from the aggressor.

The failures of some recent aggressions do not of course prove that future acts of aggression would be equally disastrous. The aggressor has always enjoyed a great advantage in his ability to determine the time, the place, and the type of attack. Some observers feel that special purpose —chemical, biological, and radiological, as well as atomic and thermonuclear—weapons so strengthen this advantage as to make it decisive.

Any aggressor must make a number of important decisions about his attack: what objectives to seek; what weapons or forces to apply; what geographic areas to include or exclude; and whether to employ tactical warfare, strategic warfare, or both. The terms "tactical" and "strategic" are subject to considerable confusion. As used herein, tactical warfare describes an attack directed on the enemy armed forces while strategic warfare is directed on the enemy economy and homefront. The choice of weapons makes little, if any, difference. Special purpose weapons, for example, could be used tactically or strategically depending on the nature of the target.

The aggressor may choose to wage unlimited warfare: unconditional surrender of the enemy, special purpose weapons, no geographic limitations, and both tactical and strategic warfare. Or he may choose to limit his operations in one or more ways. He may choose to seek limited objectives, he may limit his choice of weapons, he may avoid certain geographic areas, or he may concentrate his attack on the enemy armed forces rather than on strategic targets or vice versa.

The many possible variations of aggressor attacks seem to fall logically into four major categories: mass destruction attacks, conventional attacks of the World War II and Korean vintage, cold war penetrations as exemplified by Czechoslovakia, Indochina, Malaya, and Greece, and bona fide civil wars. In practice it is becoming almost impossible to differentiate between the latter two because any civil war almost immediately attracts the attention of one or both of the two great powers.

The United States has consistently stated that it will not use aggressive war to achieve its objectives. From time to time, a minority of Americans have advocated such a course of action, calling it "preventive war." The term is of course a misnomer for one does not prevent what one initiates. Moreover, an analysis of

Military force, in conjunction with other tools and techniques of statecraft, can contribute in many ways to the attainment of national objectives, thus posing a challenge to both soldiers and statesmen

"preventive war" reveals a host of deficiencies: it overlooks the great limitations of military force which we shall discuss later; it would if adopted confirm the Communist doctrine that the Capitalist world will initiate the inevitable war; it assumes that time favors the Communist world, which may be true but is certainly not necessarily so; it would certainly alienate the entire civilized world—allies and neutrals alike—jeopardizing the military support, bases, and raw materials which many are now prepared to contribute; it assumes that mass destruction war is inevitable which is not necessarily so; and it assumes that the United States cannot continue to afford current levels of defense spending which, as we shall see later, is completely false.

No strategic course of action should be rejected except with the greatest reluctance and perhaps not even preventive war should be permanently rejected. There is to be sure at least one worse course—that of abject capitulation. The proponents of preventive war, however, must face up to the premises underlying their course of action. Preventive war would almost certainly bring unprecedented disaster in its wake both at home and abroad, and for fruitful contributions to United States objectives, military force must look to other capabilities.

Defense Capability

Defense against enemy attack is the military capability most consistent with the more recent American military tradition and one many Americans would consider *the* capability of military force. Since about the turn of the century until World War II and even after, the United States placed almost exclusive reliance on latent defense in time of peace. There was some logic in this strategy because of the existence of relatively strong friendly forces—particularly the British Fleet on the Atlantic—and the absence of strong nations anywhere near our borders. However, the continued reliance on latent defense got us into the difficulties of World Wars I and II—wars which might well have been averted had the United States and the other Allies wisely used even a small fraction of their great power in what we shall later discuss as the "deterrent capability."

Today an effective defense requires a larger, more diverse, better prepared force than ever before, inasmuch as an attack can come at any time, at any place, in a variety of forms, and our allies are far weaker relative to the potential enemies than ever before.

To the extent that defense forces are ready, they obviously contribute to the "deterrent capability" as well as to the defense capability. As in the case of the aggressor, the defender must arrive at certain decisions relative to weapons, objectives, strategy, and geography. Some of these decisions are literally forced upon the defender by the actions of the aggressor, some of these choices are narrowed by the actions of the aggressor, and some are relatively unaffected.

Initially the defender does have the choice of whether to defend or not, as did the United States at the outset of the Korean conflict. Once he has chosen to defend, however, he has lost the initiative to the extent that he must fight, and fight at the time and probably—although not necessarily—at the place and with the weapons chosen by the aggressor.

The defender may choose to wage un-

Major Charles M. Fergusson, Jr., was graduated from the United States Military Academy in 1942. During World War II he served with the 6th Cavalry Squadron and 1st Cavalry Division. He was Assistant Professor of Social Sciences at West Point until 1954 when he was assigned to the Command and General Staff College as a student in the Regular Course. Following his graduation in June 1955 he went to Headquarters, Allied Land Forces Southeastern Europe, Izmir, Turkey.

limited warfare or he may choose to limit his operations in one or more ways. He may choose as his objective the unconditional surrender of the enemy—as the Allies did in World War II—or he may choose to limit his objective in any one of a number of respects. He may choose merely to throw the aggressor behind the line from which the aggression was launched, or he may attempt to punish the aggressor sufficiently to force an armistice, thus settling for less than unconditional surrender.

The defender has a similar choice between limited and unlimited courses of action in the geographical areas and in the choice of tactical or strategical targets. He may choose to set no geographical limits as to the theater of operations or he may for various political or military reasons exclude certain areas. He may choose to wage both tactical and strategical warfare or he may select one and not the other. If the aggressor is waging strategical warfare, however, public opinion might refuse to accept any decision not to employ strategical warfare against the enemy, however wise the decision might otherwise be.

The weapons the aggressor chooses to employ strongly influence—although they do not determine—the choice of weapons by the defender. An appropriate defense against a mass destruction attack would by no means necessarily be effective in defending against a civil war in some allied or neutral country. In the weapons area the defender has lost the initiative to the extent that his weapons must be effective in defeating the attack.

An effective defense against a mass destruction attack would seem to require all the weapons that a society could muster. Such a defense would clearly require air forces with all the power at their disposal. It would also require naval forces to retain command of the sealanes, permitting the tactical and logistical support of the fighting fronts—including allies—and the movement of essential raw materials back to the homefront. Mass destruction war would also require ground forces although no one really knows the exact role which these ground forces would play.

To return to the role of ground forces in a mass destruction war they would almost certainly play an important defensive role: to slow the enemy attack, to force him to concentrate and become more vulnerable to special purpose weapons, to gather information about targets for our mass destruction attacks, and perhaps to exploit these mass destruction attacks. What is more questionable is the offensive use of ground forces in anything resembling the conventional sense. As long as both sides possess extensive mass destruction capabilities, it is difficult to visualize major offensive operations by ground forces. The time would eventually come, however, in the course of a mass destruction war when one side would lose much, if not all, of its mass destruction capability. At this time the other side could resume conventional offensive operations. Moreover, mass destruction war would create an unprecedented demand for well-trained, well-disciplined ground troops both at home and abroad to retain some semblance of order in the chaotic conditions of fire, death, destruction, contamination, and radiation which would ensue.

A conventional attack might or might not be countered by special purpose defensive weapons. It would certainly require a combination of air-ground-sea forces as committed in World War II and Korea. A defense against a cold war penetration or a civil war requires conventional forces coordinated with political, economic, and psychological tools and techniques. Here the special purpose weapons may be worse than useless.

It is important to point out here that the use of special purpose weapons does not necessarily imply the choice of un-

limited warfare in the other areas. The United States could, for example, have chosen to employ special purpose weapons in North Korea with no objective other than that of forcing the Communists to the north of the 38th Parallel. Whether or not this course of action would have worked is another question, but it does illustrate the fact that an unlimited choice of weapons can be employed to seek limited objectives.

Although limited warfare may constitute the most logical course of action for a defender, even in a mass destruction war, it may in practice be difficult to adopt. In order to enlist the complete support of the society to the war effort, it may be necessary—or at least the leaders may feel that it is necessary—to arouse public antipathy toward the enemy to such a point that total victory alone will satisfy. Any limitation of the objective or any negotiation may be subjected to the charge of "appeasement." Undoubtedly, any negotiations with German or Japanese spokesmen during World War II directed toward ending the war on some basis of less than unconditional surrender would have aroused violent opposition from many quarters.

There are several possible solutions to this dilemma. The leadership of a nation must be aware of the possibilities of limited application of military force. They must be careful not to overstate the results which the military operations will bring. The military commanders themselves must be ready, willing, and able to employ their forces as ordered by responsible political authority. Also, it may be helpful to point out that limiting the objectives against an enemy or conducting negotiations with him does not indicate approval of that enemy. It merely indicates that a compromise is preferable to the costs of more ambitious objectives.

Another factor may enter here: defense may be unilateral or collective. To the extent that the defense involves collective security—and any defense in which the United States would participate would surely involve allied nations—the objectives of the other participating nations will have their influence and quite properly so. Many of the allies or prospective allies of the United States have suffered extensively from past wars and would be much more vulnerable than the United States in future wars. The United States has actually suffered relatively little from recent wars—our standard of living actually increased during World War II. Thus the more pronounced tendency among Americans to favor "total victory" may well be tempered by our allies. If the association is really collective security, their views may well prevail. In short, a defense by a collective security defense force is much more likely to be based on limited objectives than a unilateral defense. With all of its difficulties, collective security seems to be the pattern of the future.

The actions of a potential enemy constitute only one of the factors influencing the course of action we choose. Other factors include our own objectives, our capabilities, the costs of the course of action under consideration, and alternate means available for accomplishing the same objective. If we base our strategy solely upon the actions of potential enemies, we have actually abdicated our control of that strategy and are permitting the enemy to determine it for us.

Our potential enemies have made incredible errors in the past and will almost certainly do so again. It would be most surprising if the Chinese Communists in particular do not often act foolishly in the future. We must not permit relatively unimportant incidents, however irritating and exasperating, to tempt us into equally stupid responses. Just because an enemy chooses to be irrational does not necessarily mean that we should be. Unfortunately, if he chooses to wage war, then

he does in fact determine our course to a considerable degree, however much we may deplore it.

What has been said so far about defense may be illustrated by assuming an attack by the Soviet Union on Western Europe. If the Soviets should employ special purpose weapons in such an attack, the United States and the NATO allies would surely retaliate with all available weapons. If the Soviets should employ only conventional weapons in their attack, it seems somewhat less certain that our NATO allies would agree to mass destruction retaliation. However, since the NATO nations are understandably reluctant to maintain anywhere near enough conventional forces to cope with a conventional Soviet attack, the only possibility for a successful defense would rest upon the employment of special purpose weapons. Confronted by this situation the only rational choice would seem to be the employment of special purpose weapons. If this is a valid conclusion, one might in retrospect question the wisdom of the extensive postwar efforts of the United States to establish an effective international control of atomic weapons.

Whatever the choice of weapons, there would remain a choice of objectives. The NATO allies could insist upon the unconditional surrender of the Soviet Union and seek to invade and occupy her vast territory. NATO could hope to punish the Soviets—either tactically, strategically, or both—until they desisted from further attack and withdrew behind their borders, or NATO could conceivably force the Soviets to negotiate an armistice. While it is not the purpose of this article to suggest which course of action should be adopted, a few remarks seem justified.

The invasion and occupation of the vast Soviet Empire is difficult to visualize. Even assuming that it could be accomplished—and this is by no means certain—the costs would certainly be fantastic. The possibility of such a course of action raises a number of questions: Could it be done? Would the NATO allies participate in this course of action? What would we do with the Soviet Union after occupation? Could our institutions survive this effort?

Passive Nature of Defense

Defense against an external attack is essentially a passive application of military force. Planning for defense involves an estimate of the capabilities, intentions, or the overt acts of other nations. Military forces are established and maintained on the actions of potential aggressors rather than upon the objectives of the defender.

Some military observers argue that defense planning must be based upon the *capabilities* of other nations. This view seemingly stems from an inexact analogy between tactics and grand strategy. It may be possible for a division commander to plan against the various capabilities of the enemy force confronting him. It is entirely a different matter for a nation to plan against the various capabilities of potential enemy nations. Other observers, agreeing that defense planning cannot provide against every enemy capability, argue that the *intentions* of the potential enemies must determine the level of defense—and most particularly the defense spending—required. As a matter of fact, United States defense planning seems to have been based neither upon capabilities nor intentions but primarily upon the overt acts of other nations.

For example, in 1945 the United States had no intention of matching the capabilities of the Soviet Union. Even after diplomatic relations worsened and the expectations of postwar harmony faded into oblivion, there was still no response in United States defense spending in 1946, 1947, and into 1948. The overt *coup d'état* in Czechoslovakia in February 1948 did cause a minor ripple in military policy,

but it was not until the invasion of South Korea in June 1950 that military planning and spending was materially accelerated.

Planning for defense is complicated in another way; defense can be accomplished by a combination of offensive and defensive means which are at the same time complementary and conflicting. Consider, for example, the air defense of the continental United States. In defending against an air attack, it would be useful to possess offensive strategical airpower to strike the enemy airfields and launching areas; defensive air capability in the form of warning nets, fighter planes, and antiaircraft guns to fight the enemy planes that did get through; and passive defensive measures such as dispersion, bomb shelters, and civil defense to lessen the damage caused by enemy attacks. The conflict stems in large part from budgetary considerations. How much should be spent on each of the three defense measures listed above? This widely debated question illustrates the fact that planning for defense alone has many facets and is subject to wide controversy.

Deterrent Capability

To summarize, defense against external attack constitutes the major traditional use of military force by most democratic nations in recent years. Its importance remains undiminished but its realization is infinitely more difficult. It remains to be seen whether there can be anything like an effective defense in the traditional sense when each nation possesses the capability of raining unprecedented devastation on any other nation at any time. Whatever the importance of defense, it is by no means the only contribution or even the most important contribution that military force can make to the attainment of national objectives. Few would deny that deterring an attack is far preferable to the most successful defense.

It would be inaccurate to say that the deterrent capability of military force is a new concept, unique to this era. The Swiss, among others, have long recognized that a ready military force would tend to increase the costs of an aggressor attack to such an extent that it was not worth the effort. In fact, the deterrent capability is inherent to some extent in any sizable military force, past or present. It can be said, however, that the deterrent is more important than ever before in this era of special purpose weapons; that until very recently the United States had not made effective use of it, either in theory or practice; and that as a consequence much more needs to be known of the techniques of using military force as a deterrent.

A successful deterrent would seem to require:

1. That the defender possess appropriate forces designed to meet the specific type of attack the potential aggressor is capable of launching.

2. That the defender be willing actually to use that force if sufficiently provoked. (Cold war penetrations, apparently, do not provide sufficient provocation for the commitment of special purpose weapons.)

3. That the potential aggressor have a reasonably accurate estimate of the capabilities and intentions of the defender. (This presents an interesting conflict with the conventional military attempt to keep all information out of the hands of the enemy.)

4. That the defender take into account the values of the potential aggressor if they differ materially from those of the defender. (A force that would deter State A might not be equally effective in deterring State B.)

5. That the potential aggressor be rational.

Two factors merit additional attention: the kind of attacks that are to be deterred and the military forces appropriate for deterring these attacks. The attacks may

be classified once again as mass destruction, conventional, cold war penetration, and civil war. A force effective for deterring one kind of attack may or may not be effective in deterring others.

Much of the attention currently devoted to the deterrent capability concerns the possibilities of special purpose weapons in deterring attack. It is a fact that there has been no overt use of military force either of a mass destruction or conventional nature in Europe since 1945. Considering the disproportionate conventional military strength existing on each side of the Iron Curtain, this is a remarkable accomplishment for which we should be thankful. Much of the credit must be accorded to the United States Air Force with its special purpose weapons and its capabilities of delivering these weapons. The development and maintenance of mass destruction forces is an essential military requirement into the foreseeable future.

Special purpose weapons alone, however, will not suffice. They may effectively deter a potential aggressor from launching a mass destruction attack and in some instances a conventional attack. Recent history, nevertheless, provides abundant evidence that special purpose weapons have not and probably cannot deter all conventional attacks, and they provide practically no deterrent against cold war penetration and civil wars. An effective deterrent against these types of attacks requires conventional military forces coupled with other tools and techniques.

Few would deny the vital importance of deterring a mass destruction war. However, it is almost equally important to deter the other threats. These threats are well worth deterring for the costs that they would inflict alone. Even more important, mass destruction war would be more likely to develop from a conventional war or cold war situation than from a period of relative peace.

One of the difficulties inherent in the deterrent capability is the impossibility of proving the success of the mission. The greatest success of a deterrent force may be rewarded by a clamor for the reduction of the very force that has been responsible. It can hardly be overemphasized that military force may be quite productive even when it is not actively employed against an enemy. It may be at that time producing its greatest success.

Another characteristic of the deterrent capability is its uncertainty. If the deterrent should succeed for some time, there is never any assurance of its continuing success. This failure could result from the weakening of any of the five requisite factors listed earlier. In particular, it could result from the irrationality of the potential aggressor. Nations as well as individuals have committed suicide in the past and they may continue to do so in the future. Today there is a major difference nevertheless. The lack of technical competence in the past limited the effects of national suicides: a national suicide today could cause worldwide havoc.

Finally, the deterrent capability in itself provides no real solution to the basic problems besetting the world. A combination of mass destruction and conventional forces may provide the time necessary for other forces and the surge of history to provide the solutions. This provision of time would in itself constitute no small accomplishment, the possibilities of which indicate that we should devote much greater attention to perfecting the deterrent capability.

Other Capabilities

Military force possesses certain additional capabilities which, while related to those previously discussed, particularly to the deterrent capability, extend into an area of more positive support for economic and political objectives. In such roles they require an even closer coordi-

nation with the other tools and techniques of statecraft than those previously discussed.

Commitment Capability

The presence of military force of State A on the soil of State B generally provides ample warning to a potential aggressor that State A would join the fight if the aggressor should invade State B. Thus the five divisions which the United States has maintained in Europe since 1951 may well have accomplished a greater political role than military role. The most optimistic military authority would hardly maintain that this relatively small force could in itself add significantly to the defense of Western Europe against a determined Soviet attack. These divisions do clearly indicate that any attack on Western Europe would immediately implicate the United States. Such was of course not the case in 1914 or in 1939 when the aggressors gambled incorrectly on the continued isolation and neutrality of the United States. Another example of what may be called the commitment capability is Anthony Eden's statement in September 1954 of Great Britain's intention to maintain four divisions or their equivalent on the European Continent for 50 years. This promise to commit military force was widely credited with making possible the West European Association, following the rejection by France of the European Defense Community.

Military Aid

Military aid and advice can be granted—or denied—to allies or neutrals. It is almost impossible to differentiate military aid from economic aid because military aid often releases for economic purposes resources which otherwise would be devoted to military purposes, whereas pure economic aid often permits an ally to devote more of his resources to military purposes than would otherwise be possible. Military assistance has a number of possible results: it increases the absolute power of the receiving nation and usually its relative power as well; it provides a deterrent against internal or external attack; it tends to strengthen and perpetuate the current government; it tends to improve the morale of the receiving nation; and it helps gain the time required for political and economic measures to be effective. Military aid can be granted on a bilateral or multilateral basis. In the latter case it may contribute to the organizational capability.

Organizational Capabilities

Another military capability lies in the organizational sphere. International military organizations may be easier to attain than comparable political and economic organizations and may encourage, if not require, progress in these other areas. This is not entirely surprising, since military people are accustomed to working together; they are experienced at setting aside their own convictions to implement some different plan—what Mannheim called "functional rationality"—and they have gained considerable experience in international military operations during the past 15 years.

The NATO Alliance has undoubtedly contributed to the United States policy of favoring some kind of eventual integration of the Western European nations. Military coordination through NATO has apparently progressed much further and much faster than political and economic coordination. The military alliance requires economic coordination to make the military alliance effective. In this process of economic coordination, incidentally, all the complications of economic mobilization —never fully solved on the national level —are projected to the infinitely more complicated international level. In addition, political coordination must accompany military coordination if the soldier is to

be directed by politically responsible leaders—an axiom of democratic philosophy. To state this capability simply: military coordination and unification may be useful in achieving a desired economic and political coordination and unification.

Administrative Capability

Military force can further national objectives by occupying enemy territory, administering liberated territories, and accomplishing similar tasks at home in the event of martial law. This we may call the administrative capability. Military force in most societies constitutes the only large administrative organization that can actually command men, money, materials, and machines in order to accomplish such tasks. Thus the United States Army—probably as nonpolitical an organization as existed before World War II—found itself responsible after World War II for the occupation of Germany, Austria, and Japan, and the administration of many liberated areas. These tasks become progressively more political and economic, areas in which most Army officers were relatively unacquainted. The accomplishments under these circumstances were remarkable.

The administrative capability may become very important if a mass destruction war should occur. As discussed previously, in a mass destruction war the administrative problems of medical care, food, housing, and police could well be beyond the realm of present comprehension. Unless much greater progress in civil defense is made than now seems probable, much of this responsibility both at home and abroad would fall on the military forces—particularly to the United States Army.

Guerrilla Capability

Guerrilla warfare can be used in conjunction with any degree of military force from mass destruction operations to civil wars. In World War II the Allies gained relatively little experience in antiguerrilla operations—most guerrilla action favoring the West. The Soviet guerrillas behind the German lines, the French *maquis*, the Italian partisans, the Chinese Communists—all supported the Allied cause to a greater or lesser extent. In Korea the United Nations forces did gain some valuable, if unpublicized, experience in combating guerrillas.

The fact that the West did not have to fight guerrillas during World War II and did have to fight them in Korea is explained in large part by the fact that the Communists supported the West in World War II and opposed it in Korea. The Communists have long recognized the importance of guerrilla warfare and have by all accounts employed it successfully. Mao Tse-tung himself is probably the world's foremost authority on guerrilla warfare. His pamphlet, *Guerrilla Warfare*, published in 1937 in China, advanced the doctrine that has been widely followed not only by the Chinese Communists but also by the Soviets and by Communists everywhere.

Any future war between the East and the West would almost certainly be characterized by extensive guerrilla and antiguerrilla operations. To be effective these operations must be coordinated with conventional military operations and must to a considerable extent be commanded by military officers.

Guerrilla operations might prove more effective in a mass destruction war than in the past. Guerrilla forces operate widely dispersed and offer a poor target for special purpose weapons; they are capable of providing invaluable information about atomic targets; and the dispersal of enemy ground forces due to the atomic threat should facilitate the success of the guerrillas. In fact, in a mass destruction war, guerrilla type operations might prove the most practicable method of employing ground forces.

Civil War Capability

The listing of military capabilities would be inadequate without noting, however briefly, the impact of military force on civil wars. Military force can support the rebels or the Loyalists.

The importance of military force in civil wars has often been overlooked. It is still a widely held myth that revolutions are won by the masses of people who arise, throw out the rascals, and establish a new government. The fact of the matter is that in a civil war—as in all other type military operations—victory is generally won by the stronger side. In nearly all instances the stronger side in a civil war is the side that commands the loyalty of the formal military forces existing before the rebellion began. This suggests a hypothesis that no revolution can succeed unless the rebels command the support of at least part of the existing formal military forces—or stating it another way, no revolution can succeed if the formal military forces remain loyal to the existing government. The Russian, French, Mexican, Chinese, and Turkish Revolutions all support this hypothesis. The United States Civil War could hardly have lasted 4 years had not 304 West Pointers, including 148 Confederate generals, rallied to the cause of the South. More recent events in Iran, Egypt, and Guatemala provide additional evidence of the crucial importance of formal military forces in civil wars. This importance has many implications for United States policy in various parts of the world. As repeatedly emphasized, special purpose weapons simply are not suitable for carrying out many important military missions that may have to be accomplished. A civil war provides the ultimate example of a situation where the use of special purpose weapons would be inappropriate to say the very least.

The listing and brief discussion above by no means exhausts the capabilities of military force. Specifically, we have devoted little systematic attention to the show of force, to the contribution to economic warfare, to the psychological aspects of military power, and to the military threat as an adjunct to diplomacy. Enough has been shown to indicate, however, that the contributions of military force are many and varied, that they extend into areas that have not been widely recognized in the past, and that they may have more pervading implications in the future.

II. Limitations

Like the other tools and techniques of statecraft, military force suffers important limitations, costs, dangers, and disadvantages. Some of these have been implicit in our discussion of military capabilities, but they merit additional, systematic consideration. First of all the overemployment of military force in the form of wars has in the past resulted in the destruction of the very values which the military force was supposedly utilized to protect. Arnold Toynbee, the British historian, offers this as one of his major conclusions in his 10-volume *Study of History:*

In studying the breakdown of civilizations, the writer has indeed subscribed to the conclusion—no new discovery—that war has proved to have been the proximate cause of the breakdown of every civilization which is known for certain to have broken down, insofar as it has been possible to analyze the nature of these breakdowns and to account for their occurrence. There have been other sinister institutions besides war with which mankind has afflicted itself during its age of civilization . . . yet . . . war stands out among the rest as man's principal engine of social and spiritual self-defeat during a period of his history which he is now beginning to be able to see in perspective.

This is a sobering statement for soldiers

and civilians alike to ponder. If older civilizations have broken down through the intemperate application of military force, there would appear to be no logical reason why ours might not follow. Furthermore, these previous breakdowns have resulted from the employment of a rather medieval military technology. The modern military technology could prove much more efficient in destroying civilization, unless of course it is used in such a manner as to prevent the disasters of the past.

Other limitations relate to the one above. To the extent that military force is actively employed in war, the national objective of peace is lost. While it is true that peace is not an absolute objective—there being in fact no absolute objectives—it is one that United States spokesmen have continually emphasized and one which undoubtedly a great majority of Americans sincerely support. To put it simply, if we have war, then we do not have peace.

Next it is extremely important to remind ourselves that increasing the military strength of a nation does not necessarily increase its security. This seeming anomaly may result in several ways: first, the increase in military power of State A relative to State B may motivate State B (and its allies) to an even greater military effort, with a consequent decrease in security to State A. Or, State A, having increased its military force, may be tempted to employ it to overcome supposedly weaker nations, only to find that these nations were not as weak as expected. The recent history of Germany, Japan, and Italy provides excellent examples. In each case there is no question that the nations increased their military forces, at least initially. However, these forces through overt commitment precipitated an unexpected increase in strength by the defenders which led to ultimate disaster for the aggressors.

It is of great significance that the German military forces possessed a high level of technical military competence. The German Army has been widely admired and imitated. Yet the employment of this technically competent German Army brought disaster on the society it was designed to protect. Much the same can be said of Napoleon, Alexander, and perhaps most of the great captains of history. Thus the development and maintenance of technically competent military forces does not alone provide security for the society concerned. These forces must be used wisely in the pursuit of feasible objectives. In other words we are suggesting the existence of two related but nevertheless quite distinct fields of endeavor: one, the development and maintenance of technically competent military force; and the other, grand strategy or the rational employment of military forces along with the other tools and techniques in pursuit of feasible objectives. Either may be present without the other. The fact that an individual possesses great competence in one does not mean that he is equally competent, or at all competent, in the other.

Another limitation of military force lies in the many surprises which war brings in its wake. Seldom if ever have wars ended the way the participants—particularly the aggressor—anticipated. If the results could have been foreseen, the losers presumably would not have chosen to participate, assuming them to be rational. Moreover, in order to win a war, nations must—or at least feel that they must—make numerous agreements and concessions, many of which they have not foreseen and many of which they later regret. Thus during World War II the United States contributed to the building up of Soviet power and prestige, a fact that was regretted later.

Even unconditional surrender has not in the past, and probably would not in the future, produce the blessings expected

from it. We often overlook the practical fact that some political power must fill the vacuum created and this new power may not be any better—indeed may be worse—than the former. Most Americans seemed to overlook this point during and after World War II. We assumed that free indigenous democratic governments would somehow spring to life as if by magic throughout the vast areas previously controlled by the German and Japanese Empires. Few foresaw that the void would be filled not by free institutions but by communism. It may even be that the destruction of the current Soviet Empire might be replaced by something worse, although this is hard to visualize.

Another limitation of military force involves the danger of overmobilization of nations who are weak economically. As we shall see later, this danger is far less likely in the United States than in many allied nations. This conflict between economic health and mobilization provides the basic assumption underlying the extensive American military aid programs to allied nations since the end of World War II. If many nations devote too much of their production for military purposes, they may thereby further depress an already low standard of living so as to precipitate apathy, distress, or even revolt. Assuming full employment, mobilization adversely affects the economic situation in a number of ways: it lowers the standard of living, shifts manpower from productive to unproductive pursuits, diverts production from civilian to military goods with a consequent unfortunate effect on exports and on the balance of payments, creates inflationary pressures, and necessitates an increase in costly imports, further worsening an already unfavorable balance of trade.

Finally, military force alone cannot suffice in the absence of some minimum degree of political and economic viability. Or perhaps it would be more accurate to say that the costs of employing military force are not commensurate with the probable results when the requisite political and economic institutions do not exist. For example, military force could conceivably have succeeded in saving North Vietnam from the Communists. However, the lack of effective indigenous political and economic institutions would have so increased the size, costs, and duration of the military effort required and also rendered so uncertain the ultimate results, that these results were not deemed commensurate with the costs.

III. Strategic Implications

What can we conclude from examining the capabilities and limitations of military force? What guidelines for strategy and policy follow from our analysis?

1. It cannot be repeated too often that military force is a means, an instrument, and a tool for obtaining objectives—it is not an objective in and of itself. There is nothing inherently good in military force or in military operations. These are good only to the extent that they contribute to the objectives of the society which they serve. Moreover, military force is not the only means available for achieving objectives.

2. An examination of the various capabilities of military force suggests that there is no one set way in which military force must be utilized, any more than there is any one set way that the political, economic, and psychological tools must be utilized. Like the other tools and techniques, military force can be used to help your friends or potential friends and hurt your enemies or potential enemies. Like the other tools and techniques, military capabilities cover a wide spectrum of possibilities, from the mere hint of a threat on one pole to mass destruction war on the other.

If our conclusion that military force can make many and varied contributions to the attainment of national objectives

is valid, it follows that these possible contributions should be paramount in determining military requirements—to include organization, weapons, research, leadership, training, and a host of other factors. In some respects there will be no inconsistencies between the requirements necessary for mass destruction war, for conventional war, or for cold war. In other respects there will be some conflicts. The men and weapons suitable for a certain role under a certain set of circumstances may not be at all suitable for another role under another set of circumstances. A splendid tactical commander may not prove an efficient military attaché and vice versa. General Patton proved a splendid commander for the Third Army in World War II. Whether he could have proved equally effective in General Eisenhower's wartime job or General Gruenther's present job in NATO is highly questionable. Conventional amphibious operations may be impossible during a mass destruction war, but they were indispensable in Korea. Airborne forces may be of questionable value during the course of a mass destruction war, but they may be quite useful in quickly shifting troops to the far parts of the globe in situations short of mass destruction war. An example of this is the rapid commitment of French troops to Dien Bien Phu in Indochina. The fact that these forces were later overwhelmed is immaterial to the present analysis.

In short, our organization, training, research, personnel policies, and weapons must envisage the various types of missions which are likely to develop. It would be the height of folly to base our military plans on the assumption of a mass destruction war, only to encounter a threat of a different nature. In fact, the more successful our deterrent of mass destruction war, the more likely the threat will take the form of conventional war, cold war, or civil war.

The other tools and techniques of statecraft—in the form of diplomacy, economic warfare, and psychological warfare—have played important roles in full-scale war in the past and would certainly play an important part in any future all-out war. Whatever the importance of these tools in all-out war, it seems that they are of progressively greater importance as the threat changes from mass destruction war to conventional or cold war. If our efforts to deter mass destruction war are successful—which is quite possible—we will be confronted by situations requiring an even greater coordination of military force with the other tools and techniques of statecraft.

3. Our analysis of capabilities and limitations conflicts squarely with the so-called concept of "pure war." "Pure war" has never—to the author's knowledge—been clearly spelled out by United States writers, but apparently its proponents hold that military operations should in no way be limited by political and economic factors but should be pursued to victory—victory being defined presumably as the unconditional surrender of the enemy. While a number, although by no means a majority, of American military officers have professed adherence to this concept from time to time, a frequent and eloquent spokesman has been General Douglas MacArthur who said to the 82d Congress:

That policy . . . seems to me to introduce a new concept into military operations—the concept of appeasement, the concept that when you use force, you can limit that force. . . .

The general definition, which for many decades has been accepted was that war was the ultimate process of politics; that when all other political means failed, you then go to force; and when you do that, the balance of control, the balance of concept, the main interest involved, the minute you reach the killing stage, is the

control of the military. A theater commander, in any campaign, is not merely limited to the handling of his troops; he commands that whole area politically, economically, and militarily. You have got to trust at that stage of the game when politics fails, and the military takes over, you must trust the military, or otherwise you will have the system that the Soviet once employed of the political commissar, who would run the military as well as the politics of the country.

Now, the differentiation that exists between the political features and the military features, I am not able to discuss because I have not been here in Washington. Others will be able to tell you more about that than I, but I do unquestionably state that when men become locked in battle, that there should be no artifice under the name of politics, which should handicap your own men, decrease their chances for winning, and increase their losses.

General MacArthur's concept seems questionable on a number of counts. The statement that limited war is a new concept in military operations simply is not true. States have fought limited wars down through the ages of history. For relatively long periods of time, wars fought for limited objectives were the rule rather than the exception. As a matter of fact, most wars have been limited in one respect or another and as indicated earlier the United States itself has often fought for quite limited objectives.

"Pure war" is also vulnerable in its failure to recognize the political and economic content of military objectives. A strong implication extends throughout the concept that somehow military victory is separate and distinct from the other aspirations of society and is a goal worth seeking for its own value rather than for any other advantages which might be brought about as its result.

We may also question the description of war as "when politics fail, and the military takes over." This seemingly overlooks or subordinates the many inportant short-of-war capabilities of military force, some of which were discussed earlier. It also overlooks or subordinates the contributions that diplomacy and the other tools and techniques can make during the actual conduct of military operations.

Moreover, there seems to be an interesting inconsistency between "pure war" and the traditional military philosophy frequently expressed in the United States services that military commanders will carry out any orders in a cheerful, willing manner regardless of their personal views. If one is obsessed with the idea that there is one way and only one way to employ military force, then can he really be relied upon to exercise strategical judgments when ordered to carry out missions not in accordance with his personal views?

"Pure war" has had many unfortunate repercussions. It seems fair to conclude that during World War II the United States was so preoccupied in encouraging the Kuomintang and the Chinese Communists to cooperate in opposing the Japanese that we overlooked the vital nature of the struggle between the two groups. To be sure, whatever course the United States chose might have had little influence on the course of events, but on the other hand we might have influenced this course to some extent had we paid more attention to the internal struggle, even at the expense of some Chinese effort against the Japanese, an effort which contributed relatively little to the war as events were to prove.

"Pure war" also may be partially responsible for preventing the recognition that the Korean conflict was a remarkable accomplishment of which we should be proud. Too many Americans, possibly influenced by the advocates of "pure war," still do not appreciate this fact. The advocates of "pure war" may have been right

in the course of action they urged in Korea. Certainly it was a possible course of action which under the circumstances might have produced the best results. However, it might also have proved disastrous. The Soviets might have intervened unexpectedly just as the Chinese Communists intervened so unexpectedly in November 1950, and we might today be fighting World War III.

Particularly weak is the argument that under any and all circumstances warfare should be fought to achieve total victory. One never knew whether the advocates of total victory in Korea chose this course because in their view it was the best of the available courses of action or whether Korea was merely another military theater where *ipso facto*, unlimited war was applicable. None of these have even really answered the question of how much better off we would have been at the Yalu than at the 38th Parallel. Interestingly enough too is the fact that none of them have advocated conquering China or even committing ground troops therein. Thus apparently even the advocates of "pure war" are quite willing to limit objectives and weapons under certain circumstances of their own choosing.

In short, "pure war" is no longer, if indeed it ever were, an adequate philosophy for the employment of military force. It has produced many unfortunate results in the past, not the least of which is the muddying of our thought processes. It is likely to prove even more disastrous in the unlikely event that it governs future strategy.

4. Our military capabilities suggest that there is no bargain basement economy possible for United States military forces. No one service alone, no one weapon alone, can possibly succeed in accomplishing the various tasks which may have to be accomplished. Into the foreseeable future the United States must continue to develop and maintain both conventional military forces and forces trained to employ special purpose weapons. The question, "Can we afford it?" naturally follows.

We are often told that military spending is likely to "wreck the American economy." Precisely how this "wrecking" is going to come about has never been explained, and it is remarkable that so many people continue to believe and repeat this allegation so frequently without subjecting it to the critical analysis to which it is so vulnerable.

If anything can be said about military spending and the American economy, it is almost exactly opposite to the above: that military spending has been instrumental in maintaining the high levels of production and employment that the United States has enjoyed since about 1941. In 1940 we should not forget the United States still had over 8 million men—14.6 percent of the civilian labor force—unemployed. Certainly without war this level of unemployment would not have decreased anywhere near as rapidly as it did under the stimulus of military spending.

Let us make it abundantly clear that this does not mean that only huge military expenditures can ensure prosperity. Even if Government spending should be necessary to maintain prosperity it obviously does not have to be military spending. It does mean that military spending in the past—even to a level of 88 billion dollars in 1944, far from "wrecking" the economy—actually stimulated an unprecedented period of economic growth. A comparison of the 1940 and 1954 production figures of almost any commodity will prove the point beyond the shadow of a doubt. It does mean that the United States can afford to develop and maintain the necessary military force, both conventional and otherwise, to carry out our objectives.

Certainly there is a level of military spending which would result in a lower standard of living, a decrease in capital investment, and a consequent danger to

our national economy. Since the end of World War II military spending has not come anywhere near the point where it would "wreck" the economy. This conclusion has been reached by several inquiries into the matter. One objective study has concluded that the United States can sustain an annual defense program costing up to 70 to 75 billion dollars without undue strain. The largest defense budget since World War II was the 50 billion dollars spent in 1953.

Actually the United States economy has suffered in the past from overproduction in relation to consumption in time of peace. At the present time the question is whether consumption can keep abreast of the 500 billion dollar Gross National Product which seems possible of attainment in the immediate future. There are only three major consumers of goods: consumers, capital investment, and government. Since the real goods absorbed by capital investment will only result in the production of an even greater volume of goods in the future, additional production over a period of time must be absorbed by consumption or by government.

What the United States cannot afford is a mass destruction war which would almost certainly be accompanied by considerable, if not catastrophic, devastation, and which would certainly decrease the standard of living here and everywhere else. It is a strange anomaly that some who emphasize the danger to the American economy from the post-Korean level of military spending, suggest a preventive war as a solution to the problem. Such a war would certainly stimulate strong inflationary pressures, decrease civilian investment, and result in devastation, all of which *would* tend to weaken the economy. Thus to solve a problem that does not in fact exist, some would choose a course of action which would be most likely to make the assumed danger a reality.

To summarize, the United States can afford to develop and maintain the military forces, both conventional and otherwise, that will reasonably contribute to the attainment of national objectives. In fact it can hardly afford not to maintain such forces as will provide reasonable security against war, because war is the one thing which the United States can least afford.

5. Finally, the capabilities of military force on the one hand and Toynbee's thesis on the other pose a great dilemma for the United States and for all other nations—not excluding the Soviet Union. The dilemma is how can we take advantage of the capabilities of military force in the pursuit of feasible objectives without precipitating that overuse of force which has proved disastrous in the past and which promises even greater disaster in the future? To be sure, this problem far transcends the responsibility of military leaders. It is instead a problem for the entire society and particularly the political leaders—both elected and politically appointed—who represent the people.

The military, however, must be involved for a number of reasons. First, military officers have some influence on the policy-making process itself. Second, in many cases military officers are the policy-implementers and as such should be sympathetic to—or at the very least, aware of—the problems involved. Moreover, the public statements of military officers on various political, economic, and military problems often have great influence at home and abroad.

This area of grand strategy must be studied much more by military and civilians alike. Military personnel and military schools have been concerned largely with attaining technical military competence and considerably less concerned with the over-all application of military force. Today we must have technical military

competence—in fact we must have a higher level than that attained previously. As has been previously emphasized, however, technical competence alone is inadequate. Today the military officer needs to know more about objectives and the relationship of military force to these objectives; and he needs to study the interrelationship between the military, economic, political, and psychological tools of statecraft.

It is remarkable, although perhaps human, that in analyzing a purely military problem, many military officers carefully and objectively apply the excellent analytical tools available—estimates, studies, and checklists—before reaching a decision. In the complex-areas of politics and economics, areas in which the officer is less at home, these same officers are often less willing to apply analytical tools—some of the same ones are almost equally applicable—and proceed to render, sometimes publicly, far-reaching snap judgments, more often than not the product of emotion and prejudice rather than of hard thought. It would seem more logical to exercise greater care and objectivity in the analysis of an area foreign to one's experience than one exercises in an area of competence.

Civilians have devoted too little attention to grand strategy. This inattention may be explained in part by a widely held belief that the application of military force is the proper province of the military, that the military services direct much time and attention to the problem, and that the civilian would therefore operate at a comparative disadvantage in studying strategy. All of these assumptions are of course highly questionable.

The Future

The future presents a great challenge. Although each generation tends to regard its own problems as more complex than those previously encountered, there seems to be little question that we must consider more variables and must make more crucial decisions than any past generation. There seems to be no simple solution to these problems; all courses of action possess advantages and disadvantages to varying degrees. The idea that any single course commands a monopoly of wisdom and virtue is, in the view of this author, dangerous nonsense.

This article has repeatedly implied that there has been in the United States a dangerous and unnecessary compartmentalization of military force from the other tools and techniques of statecraft. This compartmentalization has left in its wake a vacuum in the area of grand strategy into which neither military nor civilian thinking has adequately penetrated. For example, our leaders repeat continually that our primary objective is to prevent war; yet our military forces possess no theory that encompasses the deterrent capability or other short-of-war military capabilities. We are badly in need of a new military philosophy consistent with the requirements and practices of the present age.

The crucial problems that confront us will be difficult to solve—or more accurately, to live with—even if we apply all of the wisdom and maturity at our command. They will be more difficult if our actions are governed by such determinism as "pure war," questionable economic hypotheses, and emotion.

MOVING?

If you are moving, please notify the MILITARY REVIEW, Fort Leavenworth, Kansas, of your change of address. Be sure to include your name, *old* address, and *new* address.

Civil Assistance in Action

Colonel James E. Mrazek, *Infantry*
Instructor, Command and General Staff College

The author discusses briefly the origin and major accomplishments of a vast program of civil assistance. This program, designed to aid and rehabilitate Korea in an hour of crisis, is monitored by the United States Army.

AS THE conflict in Korea adjusts to its proper historical perspective, there is a danger that we may lose sight of the important United States Army civil assistance achievements. The Civil Assistance Program initiated early in the Korean conflict continues as one of the remaining dynamic United States activities in that country. Eminently important during combat when it stemmed a rising tide of typhus, smallpox, and typhoid endangering the health of our Armed Forces, this program is even more significant now when it is spending 200 million dollars each year in conjunction with the Foreign Operations Administration and the Korean Government. Many of our Army staffs and commands as well as civilian agencies of the United States Government are participating in the support of the Civil Assistance Program. It is one of the farflung operations of our Armed Forces and is intended to secure Korea for the free world.

Just what is civil assistance? What are its origins and accomplishments? Fundamentally it is a Civil Affairs and Military Government program accommodated to special conditions. Circumstances warranted its creation.

Shortly after the start of hostilities Korea was in chaos; the social, economic, and political structures of the country were torn asunder. In the provinces, loyal officials disappeared to be supplanted by Communists and their supporters. When President Rhee regained control, his provincial governments were depleted in personnel, means, experience, and sorely handicapped to resolve the distressing problems thrust upon them. Hordes of humanity, uprooted, wandering, and homeless, cluttered the country; industries were obliterated; and railroads and public works had been destroyed.

The standards of health and sanitation, normally poor, sank to dangerously low levels. Malnutrition, inadequate housing, and congestion fostered pestilence and disease. The incidence of typhus, typhoid, and smallpox rose precipitously in the civilian population. A widespread epidemic which could endanger the Armed Forces was imminent.

The United Nations Command quickly recognized the danger and reacted with vigor and promptness attesting to the importance of the threat. A Public Health Survey Team, hurriedly organized in June 1950, and recruited from public health and welfare services of the United Nations in Korea, flew to the country with orders to investigate conditions and recommend countermeasures to the United Nations and Korean Government forces, then also sorely pressed by the enemy. The situation was so crucial that with the survey completed many members of the team remained in Korea to volunteer their professional services and became the nucleus of the civil assistance organization soon to be created.

When the Pusan perimeter was breached, the United Nations Command determined

to create the United Nations Civil Assistance Command Korea (UNCACK), later to become the Korea Civil Assistance Command (KCAC) with headquarters in Pusan, for the purpose of administering a comprehensive civil assistance program to the rear areas. UNCACK had the mission of support of military operations by preventing disease, starvation, and unrest. It was allocated 50 million dollars for Civil Relief in Korea (CRIK) to be expended for the multitudinous items necessary for accomplishing the primary mission.

As the Eighth Army moved northward, UNCACK furnished each of the provinces and the city of Seoul, as they were liberated, with civil assistance teams—ultimately 10 in number—which implemented the policies and performed operations of both the headquarters and the government in each of the provinces. This assistance was provided as far forward as the corps rear boundaries of the Eighth Army. Forward of these boundaries the Eighth Army administered the program through its own Civil Affairs and Military Government channels.

Program Organization

Politically South Korea is organized into nine provinces and the city of Seoul. Each of the provinces is the seat of a provincial government and is headed by a governor appointed by the President of Korea. The city of Seoul has provincial status although headed by a mayor. The civil assistance organization is patterned after the national and local governments. The Civil Assistance Headquarters, now located in Seoul, consists of technicians and advisors who are counterparts of the ministers of Agriculture, Social Affairs, Public Health, Transportation, Communications, and heads of other ministries and government agencies. At this level they are in frequent communication with their counterparts in the various ministries discussing and making comprehensive plans for the relief and rehabilitation of the country.

Civil Assistance Teams are located in each province at the seat of the provincial governments (see Figure 1). The teams are the operating and implementing arm of the command and the backbone of the Civil Assistance Program. What KCAC is to the National Government of Korea, so too is the field team to the provincial government. The success of the entire rehabilitation effort depends in no small measure upon the smooth functioning of the KCAC field teams.

Although the size of each team may differ with locale, the typical team averages slightly over 20 persons, plus Korean personnel. Each team is comprised of five officers and an equal number of civilian technicians and enlisted men.

Retaining some identity in internal makeup with the headquarters KCAC, the field teams utilize both military and civilian personnel to carry out their mission and maintain advisory personnel to coordinate assistance projects with local officials. With sections dealing in public health, welfare, housing, sanitation, and agriculture, specialists therein are utilized to assist the speedy and efficient execution of the Civil Assistance Program as it affects the individual province. In addition to giving on-the-spot relief to any area stricken by disaster, the results of their work offer a "grass roots" example of what cooperation can mean to the Korean people in their struggle to build a stable economy.

Military operations of the future could find us in situations comparable to those in Korea where sympathetic ideologies exist but where material means for the support of a united military effort are lacking

Accomplishments

Civil assistance achieved a number of signal accomplishments. Some, although not all of these, derived from meeting the original mission of prevention of disease, starvation, and unrest. Foremost of these is in the field of health and sanitation. The Army, fearing a major disaster if disease incidence remained uncontrolled, was confronted with a number of imposing physical obstacles to its control. Not only had the population of South Korea swelled from 16 million to 20 million with refugees from North Korea, but half of her own population also fled southward. Areas previously densely populated were now teeming. Diseases that had been kept under control with great difficulty even under normal conditions now flourished. By late 1951 there were 36,000 cases of smallpox; 33,000 cases of typhus; and 75,000 cases of typhoid (see Figure 2).

Based upon the requirements developed by the Civil Assistance Command and the Korean Government, vaccines were flown into the country. A mass immunization program ensued. Within a period of months the 20 million people received 56 million immunizations. The result was immediate and impressive. The next year incidence of these diseases dropped 96 percent. Prevention is continuing with yearly immunization programs so that now the incidence of these diseases is negligible and Korea possesses an enviable health record comparable to some western nations. What is more important, these diseases never became a factor which interfered with Eighth Army operations.

Although the mission of UNCACK would imply a primary interest of this command in the Public Health and Welfare fields, it was found that related aspects of the economy of the country could not be neglected. Health was related to nutrition, nutrition to food consumption, and consumption to food availability. Consequently, the command became engrossed in problems of agricultural production and the agricultural economy. Similarly associated problems, such as transportation, power, and communications, required continued attention and support.

Korea is an ideal rice-growing country and one of the principal producers of high quality rice in the Far East. In addition, rice is the staple in the Korean diet. With the invasion of South Korea, cultivation of arable land dropped to less than two-thirds of the prewar level and importation of fertilizers and fertilization of the soil came to a standstill. In many cases, with tools and equipment destroyed, the farmer deserted his farm. Production of rice and other grain dropped to less than two-thirds of prewar levels. UNCACK, of necessity, took positive measures to correct this situation. First, under the CRIK program, funds were expended for the importation of huge quantities of fertilizer. It poured into the country from every available source. By 1954, 600,000 tons were being imported yearly. Through a process of assimilation and resettlement of displaced persons, as well as by cultivation of uplands and new areas, land under cultivation was maximized and by 1954 it exceeded that under cultivation before the war. Consequently, by the end of 1954 total grain production was 105 percent of 1949 levels (see Figure 3). Since the country is now almost self-sufficient in this respect, the United States has cur-

---

Colonel James E. Mrazek was a glider infantry battalion commander in the 13th Airborne Division during World War II. In 1949-50 he served on the staff of the Army Attaché in Prague, Czechoslovakia, and subsequently in the Office of the Assistant Chief of Staff, G2, Department of the Army. He is a graduate of the United States Military Academy (1938), and the Command and General Staff College (1948). He was assistant to the Deputy Commander and Chief of Staff of the Korea Civil Assistance Command prior to his assignment as an instructor at the Command and General Staff College in December 1954.

tailed procurement of grains for relief and welfare. Money thus saved has been diverted to durable capital-forming commodities.

Impressive as accomplishments in the fields are, they do not nearly represent a complete recital, particularly in the form of the development of capital production. Work is in progress on the construction of previously unplanned rail lines to transport coal from mines to reach using industries. Over 600 freight cars were added to the railway system and about 285,000 new rail and bridge ties replaced wornout ties on various lines. All ports with KCAC rebuilding aid are now in operation, serving as ports of entry for aid goods and other supplies. The rehabilitation of navigation aids now permits safer operation of shipping. The Republic of Korea merchant marine has been increased by nine vessels, including one ship of 7,000 gross tons capacity for transoceanic trade. Petroleum products amounting to $14,326,-321 have been distributed to the civilian economy.

Literally hundreds of UNCACK sponsored communities sprang up overnight. Approximately 8,600 CRIK-funded houses were constructed during Fiscal Year 1954 alone. The daily water production reached and passed the 1949 capacity of 66 million gallons a day, building up from a low of 13,200,000 gallons during the dark days of December 1950. About 315 welfare institutions received construction materials for repair and expansion of their facilities. This meant adequate care for thousands of orphans and destitute persons.

Power production rose to about 800

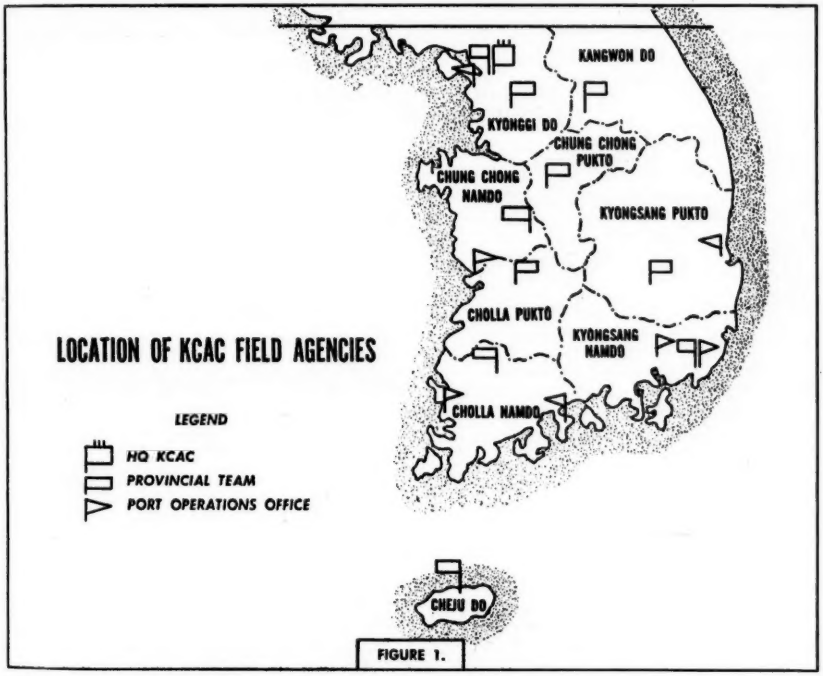


FIGURE 1.

million kilowatt-hours, the greatest production level since 1948 when power from North Korea was cut off. United States Army power barges provide about one-third of this power although a big boost has been given by the addition of a generator at the Hwachon Hydro Powerplant and the rehabilitation of other plant and transmission facilities.

The most impressive accomplishments are difficult to discern, intangible, and difficult to assess because they are in the political and ideological realms. The social structure—only 3 years ago completely liquidated—has taken on a new vigor. The political structure is again firmly knit. Hunger and insecurity, the breeding ground of communism, have virtually disappeared. Although many problems remain to be solved, comforting strides have been made and Korea and her gallant Army are staunch allies to our efforts to maintain a peaceful world. Credit for this favorable picture, so depressing only a short time ago, goes to the Civil Assistance Program under Army sponsorship and to the Korean Government agencies that cooperated so willingly with the Army to make it possible.

Added together these accomplishments not only reflect the success KCAC has had in performing its vital mission, but they also serve to illustrate vividly the profound effect the aid program has both on the social and economic rehabilitation of Korea.

The Korean Government heavily shared the responsibility for the effectiveness of the aid program, and in reality this program would have been impossible of ac-

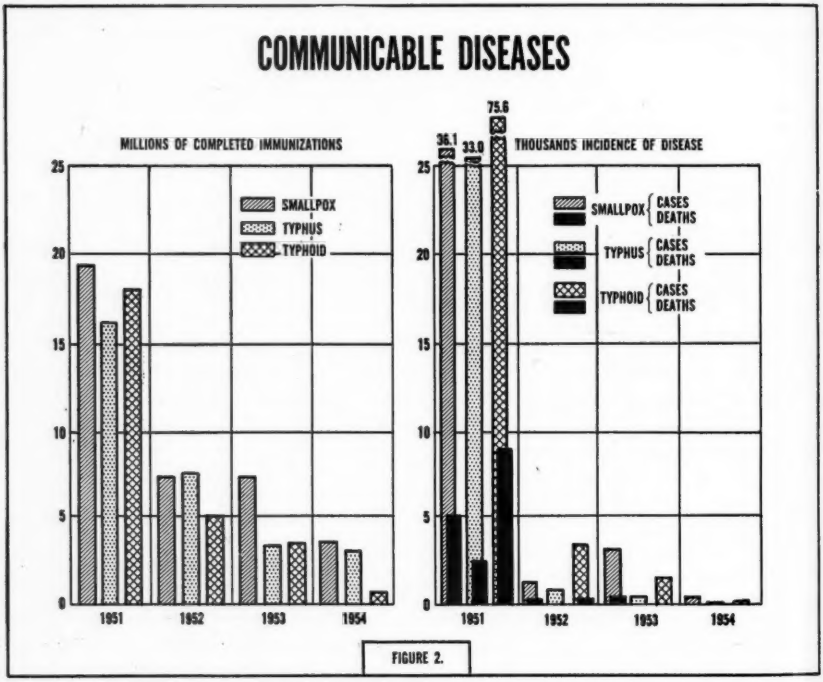


FIGURE 2.

complishment otherwise. Her Government became involved in both planning and operation.

The Korean official, competent and eager to help, knows the needs of his countryman in food, clothing, and other commodities. Generally he has also a reasonably good knowledge of the industry and natural resources of his country. Furthermore, he is acquainted with the facilities and abilities of his country and people and can more easily integrate all to the efficient support of an armed effort. We capitalized on the Korean official's ability.

In addition to this resource the Government maintained operational control over as much of the transport system as was not required for direct military operations. It also possessed a network of supply offices through which imports, exports, and domestic materials could be shifted from one area to another or filtered into the economy. Civil assistance counted heavily on these human and material resources and fostered their development and ability to take responsibility.

In the early stages of the conflict the pace of activity and requirements was so extensive that agreements reached were usually informal between the United States Army and the Korean Government. The main objective was to get the job done.

It was not long, however, before the method of operation of the aid program received definition. A bilateral agreement later to become known as the "Meyer Agreement"—after its author the Honorable Clarence E. Meyer, Minister and Special United States Presidential Representative sent to Korea for the purpose—was

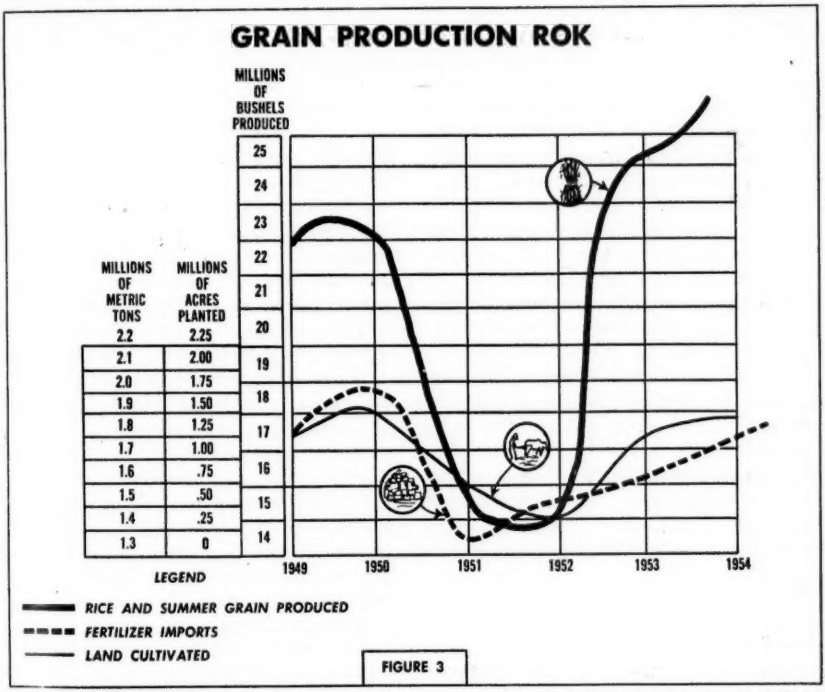


FIGURE 3

signed between the United States and Korean Governments. It delineated responsibilities and served as the fundamental framework of the aid program for succeeding years. Through its provisions and informal procedures developed as the program progressed, the KCAC and the Korean Government developed coordinated programs. Ministries worked with the KCAC technicians utilizing data gathered from the provincial governments and KCAC teams respectively. Requirements for relief grain for orphanages and other institutions, and lumber requirements for repair of institutions and for the housing of refugees filtered into Seoul for inclusion in the over-all requirements. At national level additional requirements were produced for programs involving the nation in its entirety in the fields of power, transportation, and communications.

After meshing of the programs the Koreans had at their disposal the gigantic supply and procurement apparatus backing up the United States Army. This was provident for the Koreans lacked both the experience and operating organization to accomplish this task. Procurement, generally speaking, was effected on a worldwide basis; fertilizer, for example, came from the United States, Japan, and the Middle East; coal, from the United States, England, and Canada.

However, once these materials reached the seven Korean ports, receipt and distribution became a Korean operation. Ancient and modern transportation combined to receive and distribute aid supplies to end users. The Koreans commendably carried out this aspect of the program and few major problems occurred to interfere with the flow of materials despite the fact that much of the rail transport system was antiquated and severely strained by the requirements of the purely military operations.

Competent administration of the Army's aid program has been a major contribution to the establishment of Korea as a healthy nation with improved prospects for a sound economy. At the same time it has added a strong link to the free world's chain of defenses against Communist expansion in the Far East.

The Future

Military operations of the future could foreseeably find us in situations comparable to those in Korea where sympathetic ideologies exist but material means for the support of a united military effort are lacking. The experience derived from the administration of the Civil Assistance Program in Korea should be valuable. Since we must do our utmost to husband our resources in manpower, money, and materials, it behooves us to place maximum reliance on the human and available material resources of the country in which we are operating, to the extent that they carry the burdens of their own problems, with the minimum of aid and assistance we deem necessary to assure a military operation unhampered by problems in rear areas. In terms of accomplishments versus energies expended, the Civil Assistance Program in Korea has been a profitable enterprise. We have enabled the fighting forces to operate without undue concern for the hidden enemies of disease and unrest lurking dangerously close in the civilian population; we have assisted in stabilizing a country socially, economically, and politically; and finally, we have developed a strong and willing ally. We must endeavor to achieve as a minimum these particular objectives in any area in which we operate.

WHERE WILL IT HURT THE MOST?

Lieutenant Colonel Marshall H. Armor, Jr., *Artillery*
Instructor, Command and General Staff College

Readers of this article are invited to submit their comments on the validity of this approach direct to the Command and General Staff College, Fort Leavenworth, Kansas.

A REVISED Intelligence Estimate, which emphasizes enemy *vulnerabilities* and which may, therefore, produce some reorientation of combat intelligence effort, is currently under consideration by the Command and General Staff College.

The form itself is not vastly different from the Intelligence Estimate form which with minor changes here and there has been in use for many years. Only one paragraph, titled "Enemy Vulnerabilities," is entirely new. The real difference lies in the philosophy which inspired the contemplated change.

Heretofore G2 has concentrated on determining the enemy's capabilities, and the relative probability of their adoption: "What can he do to us?" The result has often been a *defensive* outlook from the G2 section. In consequence, some aggressive commanders have tended to reject both the intelligence effort and the G2 himself. ("That crepe-draper. I'll win in spite of him.")

The customers often would not buy because G2's product was offered for sale in an unattractive package marked: "No matter how you slice it, it's still tough."

However, G2's job in the currently developing concept is as much to point out the enemy's weaknesses as it is to point out his strengths. The determination of enemy capabilities has not diminished in importance. Of an importance of at least equal, however, is the determination of the enemy's vulnerabilities—those conditions and circumstances of the enemy situation which render him especially liable to damage, deception, or defeat.

Not Entirely New

The idea is not entirely new. A subparagraph titled "Peculiarities and Weaknesses" was added to the Enemy Situation paragraph of the Estimate about 2 years ago, with the publication of Change 1 to Field Manual 30-5, *Combat Intelligence.*

The matter received little initial emphasis, however. In describing the contents of the new subparagraph the manual said simply: "This summarizes significant peculiarities and weaknesses of the force."

Command and General Staff College instruction in the preparation of the Intelligence Estimate went a little further, pointing out the importance of emphasizing to the commander the enemy's peculiarities and weaknesses "so that the commander may capitalize on them."

New impetus came recently, however, from a study written at the Army War College by Colonel Robert R. Glass, *Armor,*

The principal purpose of the proposals discussed is to stimulate offensive thinking by intelligence officers and commanders—to suggest the defeat of the enemy through the exploitation of his vulnerabilities

a onetime Command and General Staff College intelligence instructor and coauthor of the book, *Intelligence Is for Commanders*. Colonel Glass' paper was titled "Offensive Intelligence," and proposed that a consideration of enemy vulnerabilities be included in the Commander's Estimate.

The Army War College thought so well of the study that it was forwarded to Fort Leavenworth with the suggestion that it receive consideration in the writing of the projected new basic intelligence Field Manual 30-6, *Combat Intelligence, Division and Larger Units*. Continental Army Command seconded the suggestion.

Ideas Combined

Specific proposals of the Command and General Staff College have developed from a combination of the former "peculiarities and weaknessess" concept and the Glass "vulnerabilities" idea, and also consideration of strategic intelligence practices. A revised Intelligence Estimate form illustrated on page 39, together with the directions for filling it out which may appear in the new Field Manual 30-6, are currently under review at various service schools and by a number of practicing intelligence officers.

Readers familiar with previous forms for the Intelligence Estimate will miss at once the "Effect of Enemy Capabilities on Our Mission," which formerly appeared as paragraph 3 (later 5b), wherein G2 trod a tenuous path between: (1) getting deep into G3's business, and (2) staying completely out of G3's business. Current thought is that the analysis of opposing courses of action is better left to the G3 and the commander; G2 has done his share when he tells the commander both what the enemy can do to us and how the enemy can be hurt most.

Although the form itself does not reflect the change, the "Peculiarities and Weaknesses" subparagraph has been greatly expanded. It has been proposed that Field Manual 30-6 describe it thus:

Peculiarities and Weaknesses

(1) Paragraph 3e comprises a list and discussion of enemy peculiarities and weaknesses which may, upon analysis or integration, disclose specific enemy vulnerabilities. Normally, six numbered subparagraphs are included: personnel, intelligence, operations, logistics, civil affairs, and personalities.

(2) Peculiarities and weaknesses which may be mentioned, in appropriate circumstances, include the following:

(a) Personnel:

Replacement shortages.

Morale less than excellent.

Disproportionate number of very young or very old men.

High sickness rate.

Vulnerability to existing climatic conditions.

(b) Intelligence:

Susceptibility to deception or neutralization of certain enemy information collecting agencies. Susceptibility to electronic countermeasures.

Lack of camouflage discipline.

Overdependence on one or more categories of information sources.

(c) Operations:

Habitual repetition of certain schemes of maneuver.

Faulty organization of the ground.

Faulty disposition of reserves.

Inadequate troop training.

Lieutenant Colonel Marshall H. Armor, Jr., was graduated from the Advanced Course of The Artillery School, Fort Sill, Oklahoma, in 1949. He went to Korea in July 1950 where he served with the 52d Field Artillery Battalion, 24th Infantry Division, and later in the Training Division, G3 Section, General Headquarters, Far East Command. He was assigned to Fort Leavenworth as a student in the Regular Course of the Command and General Staff College in 1952. Following his graduation in 1953 he became an instructor at the College.

REVISED INTELLIGENCE ESTIMATE

Issuing section and headquarters
Place
Date and time

INTELLIGENCE ESTIMATE NR___

Map or chart references:

1. MISSION
2. CHARACTERISTICS OF THE AREA OF OPERATIONS
   a. Weather
      (1) Existing situation (including forecast and light data)
      (2) Effect on enemy operations
      (3) Effect on our operations
      (4) Effect on atomic weapons and/or CBR
   b. Terrain
      (1) Existing situation (critical terrain features, observation and fields of fire, obstacles, concealment and cover, avenues of approach)
      (2) Effect on enemy operations
      (3) Effect on our operations
      (4) Effect on atomic weapons and/or CBR
3. ENEMY SITUATION
   a. Dispositions
   b. Composition
   c. Strength
      (1) Locally available
      (2) Reinforcements
   d. Recent and present significant activities
   e. Peculiarities and weaknesses
      (1) Personnel
      (2) Intelligence
      (3) Operations
      (4) Logistics
      (5) Civil Affairs
      (6) Personalities
4. ENEMY CAPABILITIES
   a. Enumeration
   b. Analysis and discussion
5. CONCLUSIONS
   a. Probable courses of action
   b. Vulnerabilities

/s/
G2

Shortages of operational equipment or weapons, including atomic.

Lack of adequate mobility.

Inadequate air or artillery support.

(d) Logistics:

Shortages of supplies or of equipment.

Bottlenecks in the logistical system.

Inadequate dispersal of supply dumps.

Overdependence on a single means or route of communications.

Location of especially vulnerable points along principal routes of communications.

(e) Civil Affairs:

Inadequacies of food, hospital facilities, or of medical or other supplies required for the civil populace.

Hostile attitude toward the civil populace, or of the civil populace toward Aggressor.

Unsound or inadequate military government system and resultant, specific deficiencies.

Inadequacies in the control of civil communications, to include movement.

(f) Personalities:

Peculiarities or weaknesses of the enemy commander, major subordinate commanders, or principal staff officers as disclosed by or deduced from their past performance, education, politics, experience, or other basis.

May Be Omissions

(3) (a) Except as indicated below, any of the six subparagraphs may be omitted, if no enemy peculiarities or weaknesses in that category have been discovered. However, since the existence of peculiarities and weaknesses is normal, omission may be an indication of inadequate intelligence effort.

(b) The subparagraph on *Personnel* invariably includes an estimate of the status of enemy morale, if less than excellent; an estimate of the percentage of authorized strength at which enemy units are operating, if less than 80 percent; and an estimate of the enemy's combat effectiveness, if less than excellent.

(c) The subparagraph on *Logistics* is always included, and contains an estimate of the enemy's ability to support his forces logistically, even though there may be neither peculiarity nor weakness indicated thereby. The paragraph may consist of a simple statement that "Enemy logistical support is apparently adequate for either offensive or defensive operations." However—and particularly at echelons above division—the subparagraph may include a detailed analysis of the enemy logistical situation, in which both strengths and weaknesses are examined. As with any other paragraph of the estimate, reference may be made to an annex in which voluminous details are contained.

Weaknesses Analyzed

(4) (a) Since the purpose of the peculiarities and weaknesses paragraph is to develop the specific enemy vulnerabilities which will be summarized in G2's conclusions (paragraph 5 of the estimate), the subparagraphs of paragraph 3e do not consist merely of lists of peculiarities and weaknesses. Each subparagraph contains also a discussion of the extent to which the listed peculiarities and weaknesses may result in advantages to us.

(b) *1.* For example, if the enemy has an open flank, G2 states this fact in the *Operations* subparagraph of his estimate. He then discusses briefly the extent to which the open flank constitutes a vulnerability which we may be able to exploit. If enemy reserves are small, not motorized, and are poorly positioned to extend the flank, the vulnerability may be great. If, on the other hand, enemy reserves are large, motorized, and positioned so as either to extend the flank or to counterattack us if we attempt an envelopment, the vulnerability is probably insignificant.

2. Hence, in this case, paragraph 3e (3) of the Intelligence Estimate might be

written thus: "The enemy north flank is open. Available reserves, not motorized, are adequate to extend this flank a distance of only about 3,000 yards. Positions to extend the flank have not been prepared."

3. Conversely, the subparagraph might read thus: "The enemy north flank is open. However, available motorized reserves are adequate either to extend this flank beyond our zone, or to counterattack an enveloping force. Positions suitably located to block an attempted envelopment have been prepared as shown on the enemy situation map."

4. It is evident that, in the first case discussed above, the enemy's open flank is a vulnerability which G2 should reiterate in the *Conclusions* paragraph of his Intelligence Estimate. In the second case, the open flank apparently is not a vulnerability.

As is evident from the form reproduced on page 39, it is proposed that G2 present his conclusions as to enemy vulnerabilities in paragraph 5b of the Estimate. The draft Field Manual 30-6, currently in preparation, describes the paragraph as follows:

Enemy Vulnerabilities

(1) (a) An enemy vulnerability is any condition or circumstance of the enemy situation which renders the enemy especially liable to damage, deception, or defeat. An enemy concentrated to the extent that he presents a favorable atomic target is vulnerable to damage. An enemy with inadequate intelligence means is vulnerable to deception. An enemy whose forces are poorly disposed is especially liable to defeat.

(b) *Exploitation of an enemy vulnerability* is the conduct of operations in such a way as to reap advantage from the enemy's vulnerability. Thus an atomic attack may exploit the enemy's vulnerability to damage by such an attack. A tactical deception plan may exploit enemy intelligence inadequacies. An attack in a well chosen direction may exploit faulty enemy dispositions.

(2) (a) Paragraph 5b of the Intelligence Estimate is a list of enemy vulnerabilities which may be exploitable. The list is, in fact, a statement of conclusions reached through comparative study of the peculiarities and weaknesses enumerated and discussed in paragraph 3e of the Estimate. In arriving at these conclusions, however, G2 also gives consideration to the characteristics of the area of operations, pertinent aspects of the enemy situation other than peculiarities and weaknesses, and his own background knowledge of the enemy and the enemy's tactical doctrine.

List is Limited

(b) The list is confined to actual vulnerabilities. Thus an open flank which the enemy cannot, with available forces, extend or refuse may be a vulnerability. If, however, the enemy has superior forces which can readily extend the flank to an impassable obstacle, or counterattack to pin enveloping troops against that obstacle, the open flank probably is not a vulnerability.

(c) The list includes all known or deduced vulnerabilities which may be exploitable, either at the echelon of the G2 who includes the vulnerability in his estimate, or at some higher or lower echelon. For example: A division operating as part of a larger force against an isolated Aggressor army cannot alone fully exploit the enemy's inability to recover from personnel and matériel losses. Nevertheless, the division G2 properly lists "inability to recover from personnel and matériel losses" as an enemy vulnerability. The division commander may in consequence give priority in his own planning to destruction of the opposing enemy, rather than to seizure of a terrain objective. In similar circumstances a higher commander may, if time

is not unduly pressing, decide to conduct a battle of attrition.

(3) (a) In paragraph 5b each enemy vulnerability is described by a brief statement, without elaboration; for example: "Open north flank," or "Inability to reinforce against simultaneous attacks from two directions."

Exploitation Considered

(b) In determining what enemy vulnerabilities shall be listed, G2 necessarily gives some consideration to the feasibility of exploitation by his own commander, or by a higher or lower commander. He does not, however, presume to suggest how the existing advantage may be seized: The recommendation to the commander of courses of action to be adopted is not within the province of the Assistant Chief of Staff, G2.

(c) Similarly, the listing of enemy vulnerabilities does not necessarily imply that in G2's judgment every advantage should be seized. Frequently, the exploitation of one vulnerability will preclude the exploitation of another. For example: an inferior enemy may have an open flank and, at the same time, be overextended; he may, in such a case, be vulnerable to both envelopment and penetration.

As noted above, the present proposal is that G2 no longer conclude his estimate with a discussion of the effects of the enemy capabilities on the friendly mission. Nevertheless, it is contemplated that some of the considerations formerly involved will be incorporated in the "Analysis and Discussion of Enemy Capabilities."

For publication in Field Manual 30-6, the following explanation has been proposed:

Analysis and Discussion

(1) (a) In paragraph 4b, titled "Analysis and Discussion," G2 weighs the available evidence pointing toward adoption or rejection by the enemy of each of his capabilities. Additionally, he examines each capability from the enemy point of view, to determine whether or not adoption of the capability appears to be advantageous to the enemy. Finally, he examines each capability to determine whether or not there exist conditions or circumstances which may militate against its adoption.

(b) Each enemy capability, or appropriate combination of enemy capabilities, is the topic of a separate subparagraph. The first step in the development of each subparagraph is to list *indications* that the capability may be adopted, and then indications that the capability may be rejected. Further analysis and discussion of each capability follows the listing of indications.

(2) An *indication* is any evidence of enemy activity, either positive or negative, or any characteristic of the area of operations which favors the adoption or rejection by the enemy of any of his capabilities. Thus preparations for defense are a *positive* indication that the enemy may adopt his capability of defending; at the same time, those preparations are a *negative* indication of adoption by the enemy of his capability of attacking. Unlimited ceiling and visibility are weather indications that the enemy may employ all available air support; low ceiling and limited visibility are weather indications that the enemy may *not* employ all of the aircraft available to him. A good avenue of approach into our position is a terrain indication that the enemy may attack along that route; a major obstacle across part of our front is a terrain indication that attack elsewhere is more likely.

Indications Examined

(3) (a) After listing the indications pertaining to a given capability, G2 examines the capability *from the enemy point of view*, and states his conclusion as to whether or not adoption of the ca-

pability appears to be advantageous *to the enemy*. For example, a conclusion based on appropriate considerations might be stated thus: "A limited objective attack, enveloping our north flank, may achieve initial success, and will delay the launching of our attack."

(b) The statement of conclusions is omitted when the conclusion is obvious; as, for example, it is obviously to the enemy's advantage to support his operations with all available air.

(c) *1.* The statement of conclusions *may* be omitted when there is no indication that the enemy is likely to adopt the capability concerned, *except* when the capability is one which, if adopted, will render the accomplishment of our mission either doubtful or impossible. Thus when the enemy has a capability which is particularly dangerous to the accomplishment of our mission, the threat is always emphasized.

2. For example:

a. The enemy is usually capable of withdrawing his forces beyond our objective. Ordinarily, such withdrawal imposes no major threat to the accomplishment of our mission. Hence in the absence of indications that the enemy may withdraw, any statement of conclusions is properly omitted. G2's analysis and discussion of the enemy's withdrawal capability may, therefore, consist only of a statement substantially as follows: "There is no indication of withdrawal."

b. When the enemy is holding large forces in general reserve, he is usually capable of employing all or part of those forces against us. Their use may threaten seriously the accomplishment of our mission. Hence even though there may be no indication that general reserves will be employed against us, the existence of the threat must be emphasized. In appropriate circumstances, G2's conclusion might read thus: "There is no indication at this time of reinforcement by the unidentified rifle division at Rolle; however, if all or part of this division is employed in an envelopment of our north flank, the accomplishment of our mission will be difficult, if not impossible."

Final Step

(4) (a) The final step in the analysis and discussion of each enemy capability is to point out any conditions or circumstances, other than indications previously enumerated, which may militate against the enemy's adoption of that capability. Negative statements are usually omitted, except when the capability concerned is one which, if adopted, will render the accomplishment of our mission either doubtful or impossible.

(b) For example, with respect to the enemy's capability of employing general reserves against us, G2 might conclude his analysis and discussion in either of the following two ways, dependent on circumstances:

1. "The enemy's employment against us of the unidentified rifle division at Rolle will have no apparent adverse effect on his conduct of later phases of the current operation," or—

2. "The enemy's employment against us of the unidentified rifle division at Rolle will deprive him of the reserves necessary to continue his defense, should his present position be penetrated by either of the two friendly divisions to our south. Premature employment of this division will ensure his later defeat."

It will be noted, also, that a return to the term "enemy courses of action" has been proposed for use in the "conclusions" paragraph of the Estimate. The trend in recent years has been to reserve "courses of action" for application to friendly plans, and to refer always to the enemy's "capabilities." Nevertheless, some inconsistency has persisted; for example, the Commander's Estimate still in-

cludes an "analysis of opposing courses of action."

Use of the phrase "probable courses of action" in paragraph 5a of the Intelligence Estimate serves two purposes. One is to distinguish the capabilities, as stated in paragraph 5a, from the capabilities as enumerated in paragraph 4a. In paragraph 4a of the Estimate the various enemy capabilities are stated separately, whereas in paragraph 5a, it is customary to combine various capabilities into more descriptive statements of the complete courses of action the enemy is likely to adopt.

For example, the enemy's capability of attacking with forces locally available, supported by all available artillery, is stated in paragraph 4a as one capability; the enemy's capability of reinforcing his attack or defense with certain reserves is stated as another capability; and his capability of supporting his operations with a specified air effort is stated as a third capability. In paragraph 5a, however, it may be most appropriate to combine elements of these three separate capabilities as the most probable enemy course of action; for example, "Attack to envelop our south flank, reinforced by his division reserve, and supported by all available artillery and air."

The second reason for proposing use of the term "courses of action" in the "conclusions" paragraph is to avoid such cumbersome phrases as, "the enemy capability most probable of adoption." It is much easier to write, or to say, "the enemy's most probable course of action."

Conclusion

However, as has been emphasized throughout this article, the changes discussed are merely current *proposals* of the Command and General Staff College which are presently under review elsewhere. They have *not* been approved by Continental Army Command nor by the Department of the Army.

The proposals are published, as such, for the purpose of obtaining comment and constructive criticism from a broader base than is feasible through normal channels.

The principal purpose of the proposals is to stimulate offensive thinking by both intelligence officers and commanders—to suggest the defeat of the enemy through the exploitation of his vulnerabilities. It is, of course, recognized that a revision of the form for the Intelligence Estimate, however radical, cannot of itself produce offensive-mindedness in either G2s or commanders who are otherwise inclined. But insofar as a form is a checklist—if only mental—it can force all who use it to run their trains of thought on certain tracks. If one of those tracks leads "to hitting him where he will hurt MOST," it is likely that more trains will reach that destination.

AUTHORS

Authors submitting materials to the MILITARY REVIEW are requested to forward manuscripts through the Security Review Branch, Office of Public Information, Office Secretary of Defense, The Pentagon, Washington 25, D. C.

VERBAL DEFENSE

Colonel Henry E. Kelly, *United States Army, Retired*

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

CURRENT thought centering optimistically about the mobile defense concept to date leans heavily upon three dubious supports:

First, the hope that adoption of special formations or procedures will permit a weak overextended defender to defeat a powerful attack.

Second, the faith that a theoretical concept can be practically implemented as required in combat, although currently no means of execution exist.

Third, the trust that the attacker will employ tactics obviously unfavorable to himself because he has used them in the distant past.

Thus each difficult practical problem in the mobile defense concept meets with a verbal solution, the use of *barriers, canalization, dispersion, mobility, flexibility, superior control,* and *firepower,* while in practice theoretical flexibility becomes practical rigidity.

Consideration of just what powers of implementation support each of these magic words seems to be warranted. The background provided by the experience of past combat and that of existing defensive doctrine appears to serve as a logical starting point for such an examination.

Modern defensive doctrine, originally created during World War I, strives to offset the advantage inherent in the initiative surrendered to the offense by a skilled combination of *terrain utilization* and *counterattack.*

On the best available terrain a battle position up to 3,000 yards in depth is organized to magnify the effect of the defender's weapons. Coordinated and planned fires are combined with natural and artificial obstacles to delay, disorganize, bleed, and weaken the attack until it either breaks down or is whittled to proportions favorable for counterattack.

In the event local breakthroughs are achieved, sector reserves launch a preplanned counterattack on the most favorable axis to regain lost key terrain at the moment the greatest hostile weakness exists.

Against massive attack, capable of achieving a major breakthrough of the type achieved by the Germans in March and May 1918, strategically located general reserves are prepared to either man prepared battle positions or pass to the counteroffensive as the momentum, strength, and extent of the breakthrough dictates. These rearward battle positions are separated by distances sufficient to necessitate the displacement of the offensive artillery and installations each time a new position is to be attacked. In the days of horse-drawn transport, such a displacement was time consuming; hence the defender gained time while the offen-

Are we leaning upon verbal or mobile defense? This question can be answered only by examining the background of the experience of past combat and by considering and testing our existing defensive doctrine

sive lost momentum and required reorganization.

Thus by skillful use of terrain and firepower—traditional allies of the defense—the momentum and power of the attack is absorbed until at the opportune moment the defender passes to the offensive under conditions favorable to him. This sound, battle-tested doctrine is largely dependent for success upon the ability of the battle position to absorb much of the offensive superiority, which presumably originally dictated adoption of the defense. It is rare that a force capable of defeating the full, hostile strength in an initial offensive will surrender the overwhelming advantage of the initiative to defend with a view of subsequent offense.

Under existent conditions such battle positions proved adequate to stop most attacks powered by horse-drawn artillery, unreliable mile-an-hour tanks, and inconsequential air support. After World War II the snubbing ability of such a position became highly questionable, particularly in the light of Soviet World War II experience where positions up to 40,000 yards in depth were used at focal points.

During the Infantry Conference at Fort Benning in 1946, strong effort was made to modify defensive doctrine to reduce the number of forward defensive areas in order to permit increase in the depth of the battle position. Concern existed that powerful surprise attacks stiffened with self-propelled artillery, armor, and air would break into the soft rear areas occupied by installations and artillery just as the artillery was most needed to support the counterattack. Supporting this "thin out" concept was the vastly improved defensive armament of infantry. This increased power greatly decreased the importance of the 500-yard limit between adjacent defense areas dictated in World War I to ensure maximum effectiveness of mutually supporting small arms fires. Efforts to nullify existing doctrine proved unsuccessful, primarily because of conservative thought which clung to the necessity for the 500-yard mutual support concept.

Korea with her special conditions focused attention upon a noncontinuous defensive position in which strong but isolated "perimeter" defenses would be effective against lightly supported, shallow attacks possessing a limited power of continuity. The efficiency of such perimeter defenses against a powerful fast-moving attack capable of maintaining momentum to great depth remained essentially untested.

New Weapons

Today defense is further complicated by the threat of tactical employment of new weapons dictating consideration of the impact of such weapons upon existing defensive doctrine.

It is generally conceded that skillful exploitation of its inherent initiative still permits the offense to strike with power and conceivably with surprise at selected points. In so doing the offense must avoid presenting concentrated targets. This confronts it with the necessity for achieving the concentration on the battlefield itself —an extremely difficult task. Although modern command and staff planning of the attack is tremendously complicated, the defense must still be capable of meeting powerful offensives maintained for decisive effect.

Consequently against strong attack, ab-

Colonel Henry E. Kelly, Retired, served in World War I with the 77th and 1st Infantry Divisions. During World War II he commanded the 117th Regiment, 30th Infantry Division. His service includes tours as instructor at both The Infantry School and the Command and General Staff College. For 3 years he was President, Office, Chief of Army Field Forces, Board Number 3, Fort Benning, Georgia. Upon his retirement in June 1954, he became Associate Director of Research for Military Arts, Human Research Unit Number 3, Continental Army Command, Fort Benning, Georgia.

sorption within the defensive position of much of the offensive momentum is still essential if even strong reserves are to have a reasonable chance of successful counteroffensive. The weaker the defensive position, the more completely is defensive success staked upon counterattack. Under such conditions premature launching of this effort against the undiminished power of the offense chances major disaster. As the September 1954 edition of Field Manual 100-5, *Field Service Regulations, Operations,* points out, such counterattacks may well piecemeal away the forces required to block to gain the time for the movement of well-located general reserves. Thus the weaker the defensive position, the farther to the rear the counterattack must come since the offensive will move faster while retaining power and momentum longer. In fact the depth required to overextend and disorganize a powerful, well-equipped enemy may preclude forward defense and dictate protracted retrograde movement by a strong and mobile screening force.

This does not imply that an occasional well-executed counterattack against the attacker's lines of communication may not achieve early decisive success. Such an attack, however, depends for its success upon surprise and hence cannot become usual practice. It does not eliminate the all-out defense of forward terrain features provided realistic justification for such a costly operation exists, but again, this cannot become common practice.

The first question to be answered by the advocate of mobile defense, therefore, is what means will be substituted for the reduced stopping power of the thinned out mobile defensive position? The coordinated firepower of the old battle position has been sacrificed. What is proposed in lieu? Apparently barriers, canalization, dispersion, mobility, flexibility, and increased defensive striking power. These are virtuous words which must be closely examined to see if the practical means exist to give them reality.

Strong natural barriers have long permitted the conduct of a specialized type of mobile defense similar to that now conceived as suitable for use in all types of terrain. In mountain, jungle, or arctic warfare where defile routes constitute the only feasible avenues for large-scale movement, barriers come readymade. It becomes merely necessary to control the defile routes from strong islands of resistance, backing up these bastions with powerful reserves located in depth, normally along the axial route to facilitate movement and supply. These reserves are capable of moving with relative ease to wipe out at selected "mopup" points any enveloping force which attempts laborious cross-country envelopment. Meanwhile, light reconnaissance forces patrol the wide barrier areas. Under such conditions the attacker is truly canalized by natural barriers.

Then again the attacker's problem of forcing a major river line or of landing on a hostile shore furnishes a time period during which the offense is early disorganized astride an obstacle. This favors the initial forward commitment of light forces with the consequent ability to maintain strong reserves. These can be laterally disposed so that any hostile toehold can be struck well forward, while still weak. Skillful lateral dispersion of the reserve permits the successive but coordinated arrival of forces to ensure continuity of power and momentum to the counterattack. Under such conditions the counterattack can justifiably be launched early. These forms of mobile defense have long been standard and are, of course, still sound.

However, translation of such special tactics to rolling or flat terrain becomes difficult. Organization of minor high ground or small communication centers as islands of resistance still leave them far from a

nonbypassable "Brenner Pass." Thus the offensive is not truly canalized by terrain. How is it proposed to achieve such canalization? A recent article advanced a concept of a limited number of barrier traps each located behind and covered by an occupied strong point. When attacked, the garrisons of these specified strong points would withdraw, uncovering the trapped area dominated by adjacent and still standing strong points. The enemy would presumably then push forward into these killing grounds where he could be destroyed. This is indeed an intriguing concept and at times may prove effective against relatively weak probing attacks seeking "soft spots." Unfortunately, massive attacks relying upon speed and power may well overrun the adjacent strong points as well as spilling into the trap. Habitual use of such tactics would also alert the attacker against entering dominated terrain without reducing the adjacent key terrain. Such a concept is seriously lacking in flexibility. It can be likened to an attempt to catch an elephant in a mousetrap. Furthermore, if even the strongest isolated forward islands of resistance are to be of real assistance, the counterattack will of necessity have to be launched hastily and well forward where these bastions can influence the counterattack. At such times only limited local reserves will be available. Under these conditions such an effort must expect to meet the undiminished power of the offensive. What has transpired to change the relative strengths sufficiently to promise success? Again Field Manual 100-5 points out this danger.

Therefore, for mobile defense in average terrain, the closer the barrier system can reproduce the almost continuous deep obstacle of jungle or mountain, the better the chance of success. In point of fact if the artificial barrier could be continuous, it would in effect resemble a major river line. Then the entire defensive strength, less a mobile screening force disposed forward of the continuous barrier, could be held back as a striking force to counterattack any force able to work its way through the barrier. Counterattack against such a weak penetration would encounter the same favorable conditions of any early attack against a toehold. Unfortunately, construction of barriers on anything resembling such a scale seems beyond the capabilities of the foreseeable future. Furthermore, the over-all value of even extensive barriers left uncovered by fire remains unproved. Experience to date indicates only a potential of limited delay for an uncovered barrier. Therefore, the achievement of canalization by artificial barriers in average terrain lacking extensive natural barriers seems very dubious if only those means now known are used. Hence in such terrain, mobile defense, except by very strong forces, chances the encirclement and destruction in detail of the holding garrisons. Retrograde movement over deep zones with the consequent lengthening of hostile lines of communication and the progressive disorganization inherent in long advance seems to afford the best promise of eventual resumption of the offense under favorable conditions.

Dispersion

Those three stout words *dispersion, mobility,* and *flexibility* still remain to be considered. What practical problems confront their implementation? Every combat formation created since the dawn of military history has striven to utilize the maximum dispersion commensurate with power and control. Even in the days of the rock missile and the arrow, undue concentration increased casualties unnecessarily.

Hence the maximum *free dispersion* achievable without loss of power or control has always been the aim of every combat formation. In fact a degree of "purchased" dispersion has been utilized

since World War I. The machinegun forced the increase in the interval between skirmishers from 1 to 5 paces early in World War I. The squad leader's ability to control his squad had never been fully regained, since the improved training and communications essential to offset the increased dispersion have never been forthcoming. Extension of the squad's frontage has in turn complicated the platoon leader's problem of control. Any further *purchased dispersion* must, therefore, be carefully calculated in terms of cost, as well as offset by the use of improved matériel and methods.

Applying this approach to the danger of new tactical weapons, the weakness of uncalculated dispersion becomes evident. For example, to achieve a series of weak, widely dispersed landings may minimize the danger of new weapons at the same time it makes their use unnecessary since a strong enemy can then defeat each landing in detail. Consideration of precisely what is achieved and sacrificed by any specific increase in dispersion, therefore, seems vital. Is it to be achieved by increased interval between elements or by carefully considered distribution of elements over the maximum area which can be effectively utilized? Under many tactical conditions where defensive strength is required and space is limited, as for example in a beachhead or bridgehead, overextension with its consequent weakness increases the chance of defeat by conventional means. Skillful distribution of troops and installations over the maximum area which can be strongly defended, although it may afford many worthwhile targets, seems preferable. No target the destruction of which would prove fatal is offered and the very multiplicity of similar targets affords over-all protection if hostile atomic capabilities are limited.

Troops well disposed tactically under existing doctrines do not appear to constitute an unduly vulnerable target—particularly if dug in. True the tactical importance of their position may warrant their destruction at times even if the target presented is unfavorable. A battalion of infantry well entrenched on normal defensive frontage is at times possibly an acceptable target. On the other hand a battalion in an assembly area is a lucrative target. The greatest danger is that although our texts place major stress on dispersion, they still advocate the habitual use of assembly areas. Such areas sufficiently dispersed to avoid congestion in the modern sense lose all their value as preparation and staging locations. Basically every assembly area from the battalion to the huge near and far shore staging areas of a major landing operation exists merely as a reservoir to simplify the work of command and staff.

Last minute concentration on the battlefield, traditionally decisive, therefore, becomes of overwhelming importance in the face of new weapons. The mobility required to achieve this concentration lies mainly in the ability of command and staff. Timely, sound decisions backed by streamlined, dependable staff planning constitute the basis of true mobility. Improved operational concepts can radically reduce, if not eliminate, the use of assembly areas. Accurate movement tables can maintain command control. This is achieved by timing the release of designated units to focal points controlling movement such as crossing points or entrucking areas. With such controls, units can move from one tactical position to another without undue congestion. As a hedge against unforeseen emergencies, one or two units conveniently located on a "standby basis" with good communications can be ready to substitute in an unused time period.

If the assembly area is eliminated, what will replace it for tactical units located in reserve? To date nothing seems more effective than the defensive disposition

of such a unit on the best available terrain. The extent to which such a unit should be dug in will vary in each case. Such dispositions would give reality to the concept of defense in depth. In actual practice reserves can be on the move from a defensive locality more rapidly than from the conventional assembly area with its limited debouchment possibilities. The major requirement to gain speed is the existence of rehearsed, sound plans for movement. Any increased digging required to prepare the additional defensive positions involved by such tactics will serve to improve the marginal ability of United States troops to entrench. Moreover, the increase will be less than first appears since much individual digging and construction of obstacles is required in a well-prepared assembly position which by its very nature is not strongly defensible. In such cases the labor expended is largely wasted except for passive defense against air attack. The shallow skirmishers' trench currently used in assembly positions affords very limited protection against the new weapons.

Probably the most tempting target for new weapons is the large semifixed logistical installation. Logistical installations have long been particularly glaring examples of the "all the eggs in one basket" procedure. The several characteristics required for most of these installations can usually be summarized as maximum operator and user convenience. Little effective attention has been given to flexibility, dispersion, or defensibility factors. Dispersion and flexibility of installations can be improved by the use of preloaded vans using one of several specified assorted loadings. These vans designed to permit unit loading and unloading from ship or plane can be moved on land by prime movers held in logistical unit pools. This permits the establishment of many small dumps of varied contents which can be displaced when required.

The possibility of destruction of troop units charged with vital tactical missions can be reduced in the defense by locating well-entrenched alternative troop units in depth. In the offense as previously discussed, power and momentum is achieved by the carefully timed arrival of units from dispersed tactical positions in what amounts to the modern battlefield concentration. Timing of arrival is more important than speed of movement in achieving continuity of effort.

While adequacy of dispersion does constitute a vital essential of modern war, its achievement presents major practical problems. Furthermore, it is a 2-edge sword since the enemy must be credited with equal anxiety to employ it. Dispersion will, consequently, constitute an asset only to the side which employs it most skillfully. The use of skillful dispersion is closely allied to mobility, which can well be considered next.

Mobility

Effective mobility requires far more than motor transport and adequate petroleum, oil, and lubricant supplies. Paragraph 283 of Field Manual 100-5 lists many of these essentials, including air superiority and the availability of adequate space. Not listed, although fully as vital, is training. A well-trained force can move readily under conditions and within time limits, which a less-experienced force cannot match. Military history lists many great tacticians who have owed much of their reputation to the mobility of their infantry. To use as an analogy that miniature form of war, football, because an experienced, fast-moving, quick-thinking center can be successfully drawn back in defense to block any one of several openings does *not* ensure that an inexperienced, untrained player can be similarly used with success. Practical implementation of the mobility which permits a single force to be used alternatively in any one of several

widely separated critical tactical localities, requires not only skilled command and staff, but skilled, experienced, and hardened troops, in addition to the other factors discussed. For the same reasons last minute concentration on the battlefield will be difficult for inexperienced forces to attain. Too often the earmarking of motor or air transport is considered the sole requirement for troop mobility.

Flexibility

Flexibility is also deeply involved in practical mobility and consequently affects dispersion. Again it is chiefly the product of skill and experience. The less skillful the command or unit, the more the time required for commitment or for regrouping for a new movement. Flexibility, of necessity, involves familiarity with and skill of execution of a series of alternative courses of action. Such skill is rarely compatible with inexperience. A nation committed to fight its wars with hastily mobilized and trained forces is optimistic if it expects tactical flexibility. Like an improvised inexperienced football team, such forces will do better with one or two simple, well-understood procedures. Flexibility like mobility is not a product of mechanization although such means are doubtlessly helpful.

Mobility and flexibility like dispersion will be the aim of both opponents, and hence will constitute end advantages to only one. Superiority will depend upon practiced skill which in turn is dependent upon definite procedures. It is unrealistic to expect hostile attacks of slow, ponderous masses and to base expectations upon theoretical superiority of means which possess limited flexibility of employment and hence can only prove effective against rigid massed tactics.

Finally the factor of defensive striking power appears to be a favored reliance of the mobile defense concept. This, of course, is achieved by the favorable combination of all other factors. Notably of late, however, it leans heavily upon tactical use of new weapons. To some extent superiority in quantity in these means contributes to flexibility and mobility, but to an even greater extent such superiority will depend upon skill of employment.

Regardless of the range and power, tactical weapons must be capable of engaging fleeting and mobile targets if they are to be decisive. When both opponents possess such weapons, timing of employment and selection of targets becomes vital. Under such conditions timely target acquisition in sufficiently specific terms to permit adequate accuracy of fire becomes decisive. When success depends upon whose atomic capability is first destroyed, accurate target acquisition is not only decisive but most difficult. A chain is no stronger than its weakest link. Accuracy of missile or even of general intelligence information is of limited use until critical, fleeting targets can be located and reported in specific terms usable to the gunner.

Summary

In summary this discussion has attempted to stress these factors, which, although realized by many, are still apparently not accepted.

1. Reliance upon words which are not backed by practical ability of implementation is extremely dangerous.

2. Mobile defense measures must consider three types of terrain where the defense:

Is organized *behind* a broad obstacle, such as a river, whose passage divides and disorganizes an attack to an extent favoring early counterattack.

Is organized *upon* a natural obstacle, impassable for large-scale forces except at defiles. This permits the defense to concentrate on defense of these defiles while maintaining surveillance of the wide stretches of difficult terrain. Jungle, moun-

tain, and arctic defense falls largely within this category.

Faces terrain which possesses neither of the foregoing advantages. This is the *difficult* problem. Basically the first consideration is that a striking force large enough to justify plans for successful counteroffensive must be held available and suitably dispersed. The remaining forces available to man a defensive position will generally be limited under these conditions. Normally this limited strength does not justify a defense. Organization of this limited strength as a mobile delaying force rather than as holding garrisons of a mobile defense will generally be preferable. Retrograde action can then be conducted over a depth calculated to disorganize the attacker and overextend his lines of communication. Where the terrain affords only average strength this course affords the best promise of favorable conditions for a counteroffensive launched by adequate reserves held out for this purpose.

3. Carefully calculated dispersion is essential to modern combat. This requires great depth to the defense and concentration only on the battlefield for the offense. With such tactics the use of assembly areas of any type or of unwieldy critical logistical installations is as incompatible as is excessive dispersion.

4. Dispersion, mobility, and flexibility are far more dependent upon skill and training of command, staff, and troops than upon means of transport, although such means simplify the problems.

Conclusion

In conclusion it is hoped that this article may serve to stimulate discussion. The measures and means to implement the terms discussed may well be in existence. To be really effective, however, they must be known and practiced by the entire Army. In this connection a portion of a paragraph in the Foreword of the recently replaced Field Manual 100-5 of August 1949 seems worthy of quoting.

A considered balance between the conflicting dictates of secrecy and the dissemination of information requisite to the development of sound doctrines of employment must be maintained, if timely realistic employment is to be practicable.

The question is, are we leaning upon verbal or mobile defense? This can be answered only by realistic practical war gaming and test of academic theories. The Franco-Prussian War was lost before it began through the adoption of untried academic theories which proved impracticable of execution when the test came.

Today, new concepts of war are being advanced as people ponder the effects of new inventions. These new concepts are often in conflict with time-tested procedures. Some zealots will oppose them; others, mistaking special applications for new principles, will religiously oppose everything else. Commonsense shows that balance is needed. We must keep a watchful eye on both extremism and entrenched conservatism. Time moves, and we must move with it—and even ahead of it if possible; but time's applicable lessons should not be junked.

Admiral Robert B. Carney

ARE WE FLYING TOWARD STRATEGIC DISASTER?

Major James A. Huston, *United States Army Reserve*

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

AMERICANS may be racing toward ill fortune in a future war through misplaced reliance on strategic airpower. Never was it more true than now that theories of warfare need to be re-examined continuously. Of particular urgency is the re-examination of American doctrines of airpower.

The fundamental question no longer is whether airpower should be accorded a place of primacy in the means of warfare. The basic issue is not the conflict of interests among Air Force, Army, and Navy over control of airpower; nor is it even land-based versus carrier-based aircraft. The fundamental question is one which accompanied the earlier question, in the 1920s and 1930s, of the acceptability of airpower itself: that basic issue is strategic airpower versus tactical airpower. It is the question of the proper use of airpower—of the proper objectives for air attack. It is a question of life and death. The argument is an old one, although now those who suggest that our chief reliance should be upon tactical airpower seem almost to be presenting a novel idea. In some respects of its application perhaps it is more or less new.

Strategic airpower refers to that directed against a nation's industries, resources, and cities—that aimed at the enemy's warmaking potential in terms of the national economy and the morale of the people. Tactical airpower, on the other hand, is that directed against more immediate military objectives: bases, supply dumps, troop concentrations, airfields, transportation and communications lines, fortifications, and against objectives under attack by surface forces.

Reflecting an attitude common almost from the beginning of the Army Air Corps, the Air Force currently tends to emphasize strategic airpower in its policy and doctrine—it has the support of a vocal and numerous following in that position. In practice, when considered with the tactical missions of the Air Force and of Navy and Marine aviation, American doctrine currently represents something of a compromise which seeks to satisfy the demands for both strategic and tactical airpower.

Whether this is a wise policy is open to serious doubt. It is not unreasonable to assume that the air effort of the United States should be concentrated in that which, in the event of war, would most likely lead to victory in the shortest time; at least cost in lives and resources; and

Americans may be racing toward ill fortune in a future war through misplaced reliance on strategic airpower. Now more than ever it is urgent that theories of warfare need to be re-examined constantly

with the least destruction to our enemies as well as to our friends and to ourselves.

The Concept

The patron saint of the Air Force in developing its doctrines of strategic bombing has been General "Billy" Mitchell. Back in 1925 he wrote:

In the future the mere threat of bombing a town by an air force will cause it to be evacuated, and all work in factories to be stopped. To gain a lasting victory in war, the hostile nation's power to make war must be destroyed—this means the factories, the means of communication, the food producers, even the farms, the fuel and oil supplies, and the places where people live and carry on their daily lives. Aircraft operating in the heart of an enemy's country will accomplish this object in an incredibly short space of time.

Again in 1930 Mitchell wrote:

The advent of airpower, which can go straight to the vital centers and either neutralize or destroy them, has put a completely new complexion on the old system of making war. It is now realized that the hostile main army in the field is a false objective, and the real objectives are the vital centers. . . . The result of warfare by air will be to bring about quick decisions. Superior airpower will cause such havoc or the threat of such havoc in the opposing country that a long, drawn-out campaign will be impossible.

Of course all this did not happen in World War II, but enthusiasts for strategic bombing assure us now that it certainly would happen in another all-out war.

Perhaps of broader influence than Mitchell in developing the doctrine of strategic bombing was the brilliant Italian airman, Giulio Douhet. Assuming that civilian morale would be broken by the bombing of centers of population, Douhet held that the primary objectives of aerial attack should not be the military installations, but should be the industries and centers of population having little direct connection with surface armies. Air superiority would be obtained, according to his view, not only by the destruction of enemy airbases, but also by destruction of the factories which support the enemy air force.

Currently, Alexander de Seversky has become a leading apostle of strategic power. In his *Victory Through Air Power*, published in 1942, Seversky urged that strategic airpower could bring victory in World War II without the costly invasion of massed armies. Above all he sought to free airpower from dependence either on advance bases or aircraft carriers. He foresaw a day when long-range heavy bombers would take off from home bases and tear at an enemy's industrial vitals 6,000 to 8,000 miles away—and return nonstop. More recently, in *Air Power: Key to Survival*, Seversky has applied his theories of strategic bombing to current war plans.

According to this strategy which has had the staunch support of such leaders as Senator Robert A. Taft and former President Herbert Hoover, the assumption is accepted that bases in Europe and Asia cannot be held. All American forces, therefore, should be withdrawn to the American Continent, and work should begin at once on building a strategic air force which can strike at the Soviet Union from bases here. Should war come, according to this view, the occupation by the Soviet Union of all of Europe (with the possible exception of the British Isles), the Mid-

---

Major James A. Huston served with the 35th Infantry Division in Europe during World War II. Subsequent assignments have included service with the Office, Chief, Army Field Forces, and Office of the Chief of Military History, Department of the Army. He received a Ph.D. degree from New York University, and has been Assistant Professor of History at Purdue University since 1946.

dle East, India, and Southeast Asia must be accepted as inevitable, if unfortunate. The war could be brought to a speedy conclusion, however, because American strength would not have been dissipated in attempting to hold indefensible oversea bases, and the strategic airpower of the United States would bring its full weight to bear against the industries and cities of the Soviet Union. It is even suggested that friends in Soviet-occupied countries might be spared, for destruction of the home cities of the Soviet Union alone would be enough to bring victory quickly.

The report of the President's Air Policy Committee, *Survival in the Air Age* (The Finletter Report) in 1948 suggested that the only defense for the United States against devastating atomic attack was the strategic airpower to deliver an atomic counteroffensive against the enemy's major cities and industries.

The Fallacy

All this has led to the spread and acceptance of a series of fallacies which in themselves could impair seriously American security. The first of these is the *fallacy of strategic blitzkrieg*. Always anxious to find ways for winning wars quickly and cheaply, people have turned to strategic airpower as their great hope, and enthusiasts for that type of war have permitted and even encouraged popular assumptions that strategic bombing is the ultimate in lightning war. Possibly future developments will give some substance to that notion, but so far strategic bombing has been a weapon, not of blitzkrieg, but of attrition. Just as a tight sea blockade may, in time, force a vulnerable enemy to capitulate, so effective strategic bombing would, in time, so dislocate a nation's economy as to force it to surrender. It would not be a quick victory, or even a cheap one. Even if atomic, or other, bombing attacks were able to destroy most of a nation's armaments industry at a single blow, that in itself would not immediately stop well-equipped armies already in the field, nor would it make retaliation in kind impossible. It would not do that any more than a sudden, devastating attack against Detroit, for example, would immediately leave the United States without motor transport. So far as production of civilian cars was concerned, all the major automobile factories in the United States in effect were knocked out—and remained out of production for nearly 4 years—during World War II; yet millions of cars still were moving over the highways in 1945.

In Germany, however, strategic bombing during World War II failed to knock out industrial production quickly. On the contrary, war production in Germany actually *increased*, in spite of the impressive totals of sorties flown and tonnage of bombs dropped, until after mid-1944. The timing of the atom bomb attacks and the Japanese surrender in 1945 has had a most unfortunate result in leading to a popular association of the two as cause and effect. Actually the Japanese had begun peace feelers several weeks before the atom bombs were dropped—and even before the Potsdam Declaration. As the United States Strategic Bombing Survey has pointed out, Japan already had been brought to the brink of defeat by the naval blockade, and its conclusion is that Japan would have surrendered at least by November or December even if no atom bombs had been dropped, even if the Soviet Union had not entered the war, and even if no invasion of the home islands had been planned. One other fact should be remembered here in relation to atomic attack and quick victory. After the atom bomb attack on Hiroshima, the Strategic Bombing Survey reported, "the railroads running through the city were repaired for the resumption of traffic on 8 August, 2 days after the attack."

Korea has demonstrated the complete

helplessness of strategic bombing in bringing quick victory in a war of that kind. There, air attacks reportedly demolished North Korean industry, yet North Korean and Chinese forces appeared to be better equipped than ever. The obvious answer to this, of course, is that equipment was coming from outside Korea. Let us suppose that American strategic bombers had been able to destroy all the major factories in China, Manchuria, and the Soviet Union. Would that have stopped the shipment of supplies? Of course not, because most of the equipment undoubtedly was coming from the huge stockpiles of Japanese, Soviet—and American—World War II equipment which had been built up.

The same question could be turned around and asked of the United States. What if the Chinese Communists had been able to destroy the armaments factories in the United States? The results would have been hardly noticeable, because most of the equipment—including guns, tanks, ammunition, and vehicles—which United Nations forces used during the first 2½ years of the fighting came from American World War II surplus equipment.

This leads to the further *fallacy of victory through airpower* (by which the advocate means victory through *strategic* airpower). This view admits that it may take some time, but that victory can be won decisively and relatively cheaply by devastating air attacks against the enemy's homeland. Specifically this assumes that even should Soviet troops overrun all of western Europe, victory still could be won by destroying industry in the Soviet Union. "Strike at the roots," it is said, "and the vine will wither away." The trouble with this is that this vine, like the ivy, can develop its own roots elsewhere. It is a strange doctrine which says that the Soviet Union can be defeated by giving her a larger industrial plant than her own and then proceeding to destroy her smaller home industry. Here an American strategy based upon strategic bombing would arrive at a terrible dilemma—to let the Soviets take over this vital European industry and put it to their own use, or to demolish the cities and bring death to hundreds of thousands of our own friends.

A third fallacy which appeared in strategic bombing during World War II was the *fallacy of schrecklichkeit* (frightfulness). The doctrine of victory through terror is one of the most diabolical doctrines of modern times. Belligerents have taken recourse to it, of course, from the earliest times, but in particular it came to be associated with the Kaiser in World War I. Hitler advocated such a policy when he launched the attack against Poland to touch off World War II. He told his officers:

Our strength is in our quickness and our brutality. Genghis Khan had millions of women and children killed by his own will and with a gay heart. History sees only in him a great state builder. . . . The aim of the war is not to attain certain lines, but consists in the physical destruction of the opponent. Thus for the time being I have sent to the East only my 'Death's Head Units' with the order to kill without pity or mercy all men, women, and children of Polish race or language. . . . Be hard. Be without mercy. Act quicker and more brutally than the others. The citizens of western Europe must quiver in horror. That is the most humane warfare for it scares them off.

Such thinking, although not so sanguinarily stated, also characterizes some of the theories on strategic bombing—although it was the Germans themselves perhaps more than anyone else who demonstrated the fallacy of it. One of the central considerations underlying Douhet's theory was the assumption that civilian morale would be shattered by the aerial bombardment of centers of population. On this point Douhet wrote:

What could happen to a single city in a single day could also happen to 10, 20, 50 cities. And, since news travels fast, even without telegraph, telephone, or radio, what, I ask you, would be the effect upon civilians of other cities, not yet stricken but equally subject to bombing attacks? What civil or military authority could keep order, public services functioning, and production going under such a threat? And even if a semblance of order was maintained and some work done, would not the sight of a single enemy plane be enough to stampede the population into panic?

The Finletter Report implied the acceptance of a certain amount of plausibility in this theory. Possibly atom bombs would work better to terrorize the population than did such attacks as the 1,000-plane raids on Hamburg or the fire-bombing of Tokyo—which resulted in twice as many casualties as did the atom bomb on Hiroshima—but nothing in World War II experience indicates it. On the contrary, massed bombing attacks against the civilian population seemed to have the opposite effect. Instead of giving up in despair, the people became only more determined, and the bombing, far from breaking their morale, actually spurred them to even greater efforts to increase war production.

This implies a further fallacy in current American strategy—the *fallacy of the strategic deterrent.* This is the converse of the *fallacy* of *schrecklichkeit.* It is the assumption that the only way to defend ourselves from mass air attacks against our cities is to threaten greater destruction against the cities of potential enemies. Of course it is true that fear of retaliation is an effective inducement which persuades nations to forego certain measures, but it is doubtful whether it can be applied effectively to the case of the bombing of population centers. Again, quite the opposite result seems more likely. Until recently the Soviet Union had placed little emphasis on the development of long-range strategic bombing. However, now reports indicate that the Soviets—doubtless persuaded that it is the thing to do by the numerous announcements on the subject coming from the United States—seem to be building a sizable strategic air force. Thus instead of persuading the Soviets to desist from strategic air warfare by fear of retaliation, the result of American emphasis on this type of attack has been to invite the Soviets to prepare for making just such an attack.

Possession of the atom bomb by both sides seems to emphasize the importance, not of refraining from making an attack, but of being able to deliver the first blow. The factor which deters aggressors is fear of losing the war which they would start. Possession of the atom bomb may encourage a dangerous overconfidence in an aggressor that now if he strikes powerfully enough and boldly enough against an unsuspecting neighbor, he will be able to win at a single blow. No assumption could be more fallacious or more foolish, but this encouragement to attack rather than to hold back may be a consequence of atomic power. Moreover, even if threats of attacking enemy cities should result in having our own spared, we could still lose the war. An enemy tipped off that our major defense consists in threatening his cities with strategic bombing doubtless would pattern his war in such a way as to minimize the effectiveness of that indirect weapon—in localized affairs, for example, like Korea.

If the Soviet Union is to be considered as a possible or potential enemy of the United States—and of course no other nation has the power to pose such an important threat at the moment—a number of serious considerations need to be taken into account before we accept strategic bombing as the means for sure, quick, and cheap victory. In the first place, all in-

dications are that since World War II the Soviet Union has been building up huge stockpiles of war equipment. Former Secretary of the Air Force Finletter has stated:

Ever since the war ended the Soviets have been busy building up their military force. They have thrown a huge part of their total national effort into the building of the machines of war and into the development of the newest devices of scientific and engineering talent.

The larger these stockpiles are the longer it would take strategic bombing to have any noticeable effect.

Second, it should be remembered that Soviet industry is far less vulnerable to strategic bombing than was that of Germany and Japan. Not only is heavy industry in the Soviet Union dispersed in centers hundreds of miles apart—as in the Donets Basin, in the Urals, and in the Kuznetsk Basin—but also it is well dispersed within each of the major centers, and smaller industrial centers are developing all across Siberia.

A third consideration would be the probable Soviet reaction to strategic bombing attacks. Inasmuch as the destruction of all the major cities of the Soviet Union would not reduce the immediate striking power of the Soviet armies until many months had passed, it could be expected that those armies would overrun western Europe. Then the prospect would be to stand by helplessly while industrial facilities there turned out weapons for use against us, or, as is likely after a time, to try to destroy those industries by bombing too. It is no wonder that our European allies tremble as they look at the proposed American strategy.

Furthermore, the Soviets could be expected to retaliate with atomic attacks against our cities. This would be a war of complete destruction. That grim prospect, however, does not necessarily represent the true pattern which the next war, if and when it comes, will follow. It is within the power of the United States to prepare herself in such a way as to make that kind of war unlikely. The means for doing this is *tactical airpower*, not strategic bombing; it consists of giant fleets of fast fighters, light and medium bombers, and interceptors, not in small fleets of giant bombers.

The Tactical Concept

In developing strategy for war it is necessary to keep sight of the fundamental purpose of war. Fundamentally, of course, wars are waged for political objectives—although Americans sometimes lose sight of that fact in bland assertions that "there is no substitute for victory." Nations ordinarily do not go to war just to win a military victory as such—just to improve their standing as championship contenders. As a means of achieving underlying political objectives, war may be said to have as its maximum object the imposition of the will on the enemy; its minimum object must be to restrain an enemy from imposing his will upon us. In none of these is there any reason for the apparent current assumption that the object of war is to inflict the maximum possible destruction on the enemy. Americans find limited wars almost beyond the endurance of their patience. They call for "victory," and they are sure of victory only when the enemy has been completely destroyed physically.

Perhaps we would do better to look more to the counsel of Saint Augustine, and less to that of Douhet, for guidance in the conduct of war. One of Augustine's great principles on the conduct of a just war was that only so much violence might be used as was necessary to attain the objectives of the war—the restoration of justice and peace. If this view be accepted, then every city needlessly destroyed, indeed every bomb dropped beyond those essential to the winning of the objectives

of the war, is an immoral act. Saturation bombing of centers of population is wasteful of resources, it adds to rather than solves the problems of peace, and it is inhuman in its destruction of life and property. Of course war is an inhuman business, but destructiveness which goes beyond military necessity has no part in the policy of a civilized nation.

Even if strategic bombing were shown to be the best military strategy, it should not be without limitations. If oil were the critical item in the deterioration of the German war machine, then all other targets of the strategic bombing offensive never should have been attacked. It is not enough to say that German steel mills were contributing to the German war effort, and therefore should have been destroyed. It should have been necessary to show in addition that the destruction of those factories would in fact contribute directly to the Allied victory. If the German war machine were going to collapse from want of oil before loss of steel production would become serious, then the steel mills never should have been touched. Admittedly intelligence reports might leave doubts as to which targets really were critical, in which case—so long as recourse to strategic bombing had been accepted—it would be necessary to attack a number of different types of industrial targets. The point here, however, is that if accurate intelligence is available, then strategic bombing should be limited to the really critical targets.

A wiser course might be to avoid strategic bombing altogether as a major element of the national strategy. The alternative would be overwhelming tactical airpower. This would mean planes designed and pilots trained for intruder assaults against enemy military targets, for combat against enemy aircraft, and for close support of ground forces. It also would include a prominent place for the atom bomb.

Let us look at the situation in Korea. What kind of air attacks against the Communists would have the quickest military results—strategic bombing of factories in Manchuria, China, and Siberia? No. The quickest results could be obtained by a numerous and highly trained and well-equipped tactical air force which is able to operate at night as well as day against enemy supply dumps and rail lines. Leaving political considerations aside, these would include airfields, railway connections, and supply dumps in Manchuria—but it would not include the cities as such or the factories.

Now let us look at it from the other direction. What would have been the most profitable use of airpower which the enemy could have used against us to weaken us most quickly in Korea. Would it have been the atom bombing of New York, Chicago, Detroit, and Washington? Of course not. The factor which would have hurt our effort in Korea most swiftly and seriously would have been the bombing, perhaps with atom bombs, of our principal port and main supply base—Pusan.

The type of air attacks which would gain military results most quickly, and which at the same time would be the most economical use of our own war resources, would be the tactical attack of military objectives. Successful bombing attacks against a series of major supply depots certainly would have a crippling effect on the troops who were depending upon those supplies. It would do more that that. It would put a strain on the enemy's war economy just as surely as would destruction by strategic bombing. Destruction of finished products has the effect of rendering useless all the factories, all the manpower, all the raw materials, and all the transportation facilities that went into their production and movement. It would require ever so much greater destruction, greater cost, and weeks or months of time

to accomplish the same result in a given situation by strategic bombing.

To be effective, tactical airpower, like strategic airpower, must be a continuing thing. Neither is a one-shot affair. The key to the air superiority which would permit frequent repetition of attacks against critical points and which would make possible continuous surveillance is overwhelming tactical airpower.

The Air Force's doctrine of tactical airpower probably is sound, as far as it goes, although predilection for strategic bombing has imposed severe limitations on the effective application of that doctrine. Briefly this doctrine assigns three priorities for tactical air attack, in this order:

1. Winning and maintaining air superiority.
2. Isolating the battlefield.
3. Close support for ground forces.

The immense advantages which Allied forces enjoyed by reason of their air superiority during the latter phases of World War II are undeniable. The Normandy invasion and the rapid buildup in France hardly would have been possible without that superiority. The sobering lesson to be read from that experience for current military policy is in seeing ourselves now facing a situation similar to that in which the Germans found themselves in 1944.

Much has been made of the conflicting theories of defense with which German commanders approached their problem of holding western Europe—the Rundstedt view that the coasts should be defended lightly with chief reliance on large mobile reserves held deep in the interior for strong counterattacks, and the Rommel view that the Allied invasion would have to be beaten on the beaches from strongly held coastal defenses. What had driven Rommel to this view was not a basic difference in the doctrine of defense. He too recognized the value of flexible defense with strong counterattacking forces. He was forced, however, to the position of static defense by his experience against Allied tactical airpower in North Africa and his knowledge that Allied air superiority over western Europe would be even more complete. The essential feature of a flexible defense is the mobility of strong reserve forces. The one element most effective in making reserves immobile, and thus ineffective, is tactical airpower.

Once air superiority has been achieved by attacks on enemy airbases, the destruction of aircraft on the ground, and fighter action in the air, the tactical air forces can proceed to concentrate on "isolating the battlefield." This action, including the disruption of enemy lines of communication, destruction of supply dumps and installations, and attacks against troop concentrations in enemy rear areas, might be decisive.

When Allied troops hit the beaches of Normandy in 1944 only two bridges remained intact over the Seine River below Paris. By 20 July it was reported that no rail bridge was left standing or any rail line uninterrupted in the area bounded by the Loire River, the Seine, and the Paris-Orleans gap. It took the German 275th Infantry Division a week to travel the 150 miles from Fougères to the front. Two Panzer divisions, shifting from the east, required as much time to travel from eastern France to Normandy as to move from Poland to France. Men of a German Air Force unit left the Hague by train on 18 June and after a circuitous tour through Holland, Belgium, the Rhineland, and eastern France were unable to reach the battle area until 3 July.

Now, unfortunately, if American forces should be called upon to participate in a defense of western Europe against invasion from the east, their situation would be similar to that of the Germans in 1944. Current estimates suggest that the Soviets could muster a far greater tactical air force in Europe than could the allies.

Whatever truth there is in assumptions that Soviet divisions could overrun western Europe within a few weeks must have its basis in the further assumption that the Soviets would enjoy overwhelming tactical air superiority. As a result, tactical mobility—one of the most advantageous characteristics of American ground forces—would be seriously impaired. Allied divisions unable to move could not hope to make a flexible defense effective; yet the relatively small number of such divisions which would be available would make a flexible defense essential. Partly through overemphasis on economy at the expense of security, and partly through overemphasis on strategic airpower at the expense of tactical airpower, the United States has permitted the potential domination of possible European battle areas to go by default. Hardly a more dangerous situation for American security could be found. To suggest that such a disadvantage could be swept away by long-range counterattacks of strategic bombers against Soviet cities is to encourage a fallacy upon the American people which could undermine the very existence of the Nation.

When the German counteroffensive broke through the Ardennes in December 1944, all available airpower was called upon to help stop the drive. Specifically the major task for the air forces again was to isolate the battlefield. Air attacks were ordered in this priority:

1. Railway bridges on lines leading toward the battle area.

2. Concentrations of supplies in rail yards within the line of interdiction.

3. All communication centers and junctions.

4. Continuous harassment by fighters and fighter bombers of all rail and road movement.

Perhaps he was speaking with some exaggeration, but Von Rundstedt was reported to have said that but for the savage Allied strafing attacks the German counteroffensive would have driven all the way to Paris. Here, after 2 years of intensive strategic bombing, the Wehrmacht still had been able to assemble troops, equip them, and move them to mount a major counteroffensive in the west. Tactical airpower, directed against rail lines serving the battle area instead of deep within Germany, against supply dumps and communications instead of factories, and against military forces instead of cities, had been able to contribute decisively to the stopping of that offensive within a few weeks.

Close Support

On the other side the third phase of tactical air attack—close support of ground troops—also made important contributions to military success in World War II in spite of the discouragement of official doctrine and the diversion of strategic bombing. In mid-1943 the Army Air Corps obtained publication of an official field manual, *Command and Employment of Air Power*. While admitting a place for "combined actions with ground forces," this pamphlet set forth important reservations:

However, in the zone of contact, missions against hostile units are most difficult to control, are most expensive, and are, in general, least effective. . . . Only at critical times are contact zone missions profitable.

The very term "air support" was deleted from the official vocabulary. Nevertheless, air and ground commanders in the field achieved a cooperation which made close air support an essential part of ground action. The XII Air Support Command in Italy, the Ninth Air Force in western Europe, the Fifth Air Force in the Pacific—all worked out methods of close cooperation which earned the respect of the ground forces with whom they served. Much remained to be done, however, toward per-

fecting that cooperation when the war ended.

Although it was clear in 1945 that tactical aviation would have to find ways of making really effective night attacks—by use of searchlights mounted on planes, better flares and illuminating shells, radar, and infrared instruments—and that air-ground communication, liaison, and ground-air observers would have to be improved a great deal for close support of ground forces, those improvements had not been made when Korea presented the Air Force with critical situations which called for tactical rather than strategic attacks.

Fortunately the art of close support for ground troops had been kept alive by Marine Corps, and to a considerable extent by Navy, aviation. It was true that the Air Force also had skilled tactical airmen, but concepts which saw the next armed conflict as one of intercontinental bombers had so enervated advocates of tactical aviation that Air Force tactical units went into Korea with practically no improvement in their methods over those of World War II. Indeed their effectiveness seemed to be less. After months of Operation *Strangle* in 1951-52, with the proclaimed objective of cutting the communications and destroying the supply facilities of North Korea, the Communists seemed to be supporting more troops and firing more artillery ammunition than ever at the end of 1952.

Not only had the Air Force neglected the development of tactical aviation within its own forces, it also discouraged anyone else from filling the void. When the Navy sought the addition of aircraft carriers which would add important strength for long-range tactical support, the Air Force objected. When the Marine Corps sought to expand its air strength, Air Force spokesmen suggested that this was a duplication of effort, and it was intimated that the United States was in fact supporting four air forces when she should be supporting but one. Whenever anyone suggested that the Army should take over responsibility for its own close air support, the Air Force strenuously objected.

The Army now is in the anomalous position of having to negotiate a "treaty" with the Air Force before it can expand its own administrative aviation. The Army thus is bound by strict limitations, regardless of what it really needs, on the size and type of airplanes which it can obtain and operate. Only recently was the Army able to obtain the removal of weight restrictions on helicopters. An agreement of November 1952 provides:

Army organic aircraft are defined as fixed-wing utility or observation type aircraft with an empty weight of not to exceed 5,000 pounds and rotary-wing type aircraft.

This is the same as requiring the Quartermaster Corps to get permission from the Transportation Corps before using any trucks larger than 1½ tons. Or it would be like the Navy's objecting to the use of boats by Army Engineers, or the Navy's objecting to the Army's use of guns larger than 5 inches, or the Army's objecting to the use of machineguns or tanks by the Marine Corps. Combat responsibility should be drawn in terms of missions rather than of weapons, and then the service charged with the mission should be given the tools it needs to do the job.

On this basis the cause of national security would be better served by a recognition of the potentialities of tactical aviation for combat support which would define control of aviation along more realistic and logical lines. A more satisfactory arrangement might be a definition of missions in these terms:

Air Force.—The winning and maintenance of air superiority; isolation of the battlefield; air defense, including ground

antiaircraft artillery; Military Air Transport Service; whatever strategic bombing the Nation continues to insist upon; and long-range reconnaissance and photography.

Army.—Close support of Army ground combat forces; troop carrier support for airborne operations; air cargo and evacuation for tactical units; and liaison and observation.

Navy.—Air support for maintaining control of the seas; cooperation with the Air Force in winning and maintaining air superiority; cooperation in air defense with carrier-based aviation; close support for ground troops with carrier-based aircraft; and observation and reconnaissance.

Marine Corps.—Close support of Marine surface forces; air cargo, tactical troop transport, and evacuation; and liaison and observation.

Such an arrangement should go far toward encouraging the development of tactical aviation to the effectiveness which is absolutely essential if the United States is to maintain her place in the modern world.

It is imperative that Americans readjust their thinking to put strategic and tactical air doctrines into proper perspective. Strategic bombardment is the way of slow attrition, mass destruction, costly buildup, and leads to the neglect of air defense. Tactical airpower seeks to destroy enemy power on military terms. Properly developed and skillfully applied it can have quick results in paralyzing enemy armies and in making way for ground offensives. It avoids the perils to peace which mass destruction involves, and it contributes to defensive as well as offensive strength at less cost. The scores of fighters and attack bombers which can be had for the price of a few intercontinental bombers can intercept enemy bombers as well as attack. If defense of the United States is a matter of major concern, then the way to that defense is more likely to be found in the development of large fleets of fighters, an effective radar screen, larger and better coordinated antiaircraft artillery, and guided missiles, than in heavy bombers designed to defend America by destroying cities of Europe and Asia.

Air Force doctrine says: "The inherent flexibility of airpower is its greatest asset." Again, however, this flexibility applies especially to tactical airpower. It should be remembered that even tactical aviation can have important strategic results. The spectacular tactical successes of the Luftwaffe in 1939-41 so impressed American planners that they scheduled the activation of 800 battalions of antiaircraft artillery. Even a reduction of this figure to 575 battalions in October 1943 still left an authorized antiaircraft strength more than 2½ times as great as all armored divisions and tank battalions combined. This was the equivalent of limiting American armored power, at least for the time being, by the destruction of a number of American tank factories by long-range bombers. More than that, such an attack by long-range bombers would have been much more costly, if possible at all, and doubtless its results would have been to stimulate the American people to greater, rather than less, war production.

Ironically it has become fashionable among American airmen to criticize the German Air Force for its emphasis on tactical airpower. That is precisely where the Luftwaffe made its most effective contributions. It was when it turned to strategic bombing that its decline to ineffectiveness really set in.

If the United States would defend western Europe, which she must do if she would prevent the consolidation of industrial and manpower resources there with those of the Soviet Union in a combination which could, over a period of years, overwhelm the United States; if she would avoid the disastrous course of the Germans in permitting their ground

forces to be immobilized through the loss of tactical air superiority; if she would get the most security for her defense dollar; and if she would recognize the moral obligation as well as the political wisdom in avoiding the destruction of enemy cities beyond immediate military necessity, then she would do well to turn her attention to the development of tactical airpower—even at the expense of the Strategic Air Command—on an unprecedented scale.

Instead of thinking in terms of 70 groups or 143 wings, we should be thinking in terms of 500 wings with plans for large-scale expansion even of that force in wartime. Now the dilemma of maintaining sizable military forces in any period is the problem of obsolescence of weapons and equipment. The answer to that must be found in a policy of *continuous* modernization and improvement.

Under this policy new models would be added to the air forces every year, just as they are in the automobile industry. Such a program might operate on the basis, say, of 5-year cycles. This would mean that each year one-fifth of the oldest and most completely obsolete airplanes, of all types, would be replaced by new models which had been under development during the preceding 5 years. Retired planes would go for foreign assistance, be put in "mothballs" for emergency reserves, or salvaged. This would give a complete turnover every 5 years, and active air forces would have no planes more than 5 years old. Costly? Yes, but not nearly so costly as putting our resources in big strategic bombers and then seeing our cities destroyed by enemy air attack anyway—or our surface forces defeated in battle because of the loss of tactical air superiority.

At this stage of technological air development, offensive airpower has a great advantage over the defense. To apply this fact to long-range airpower, I need only to refer to the American plane, the *B-47*. Slightly more than a year ago, one of these planes flew from the United States to England in 4 hours and 34 minutes. There is no good defensive answer to that plane at this time. . . . The Soviets do not have an answer, and we ourselves do not have one. In addition, the United States Air Force is already beginning to receive from the production line the *B-52* plane which has operational characteristics greatly superior to those of the *B-47*.

All of this means that we have an overwhelming air retaliatory capacity in the event that war should break out today. Thus, to take the most pessimistic assumption, namely that the Soviets might be successful in overrunning a part or all of Europe now, the Soviets would still be defeated because of our great air capability. Please note that I do not say that we would "win." I recognize all too well that if a world war should break out now, there would be no such thing as a "winner." But definitely the Soviets would be defeated.

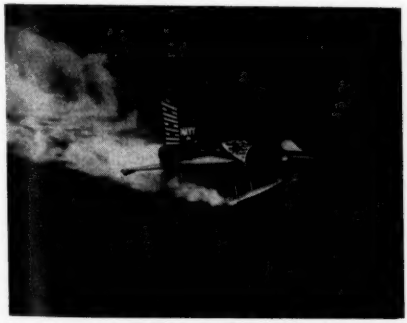
General Alfred M. Gruenther

MILITARY NOTES AROUND THE WORLD

UNITED STATES

Single Ski Plane

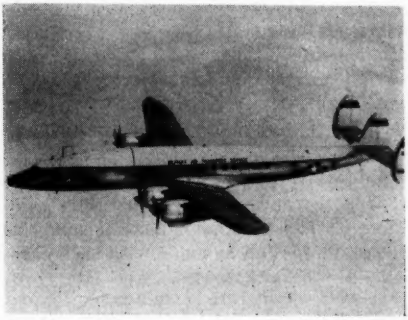
In tests being conducted under the Navy's hydrodynamic research program, an *XF2Y-1* "Sea Dart" jet fighter has been fitted with a single ski. Previous models of this supersonic plane have been equipped with twin hydroskis. It is the first jet seaplane to be built and is powered by twin *J-46* engines.—News release.



Supersonic seaplane tested with single ski.

Mighty Transport

The fastest military transport in service, a triple-duty "Super Constellation" known militarily as the *C-121C*, is ready to start long-haul service with the Military Air Transport Service. The plane which cruises at 335 miles an hour can be switched quickly to carry passengers, cargo, or hospital litter patients. It features a special, stronger-yet-lighter magnesium flooring. The *C-121C* will have large rectangular windows which will replace the small, circular ports of previous military transports. The plane can carry 75 passengers, 47 litter patients with attendants, or 14 tons of bulk cargo. It is powered by four turbocompound engines. —News release.



Fastest military transport begins service.

Rain Effects

To determine the amount of erosion or damage to objects traveling through rain at supersonic speeds up to 2,000 miles an hour, an aircraft company makes artificial rain in a pipe and shoots cannon shells through it. In the Air Force spon-

sored program, 20-mm cannon are fired through a 500-foot pipe, into which water is sprayed through holes. The shells explode 1,500 feet beyond the pipe's end and parachutes float the test specimens down to the researchers.—News release.

Drop Equipment

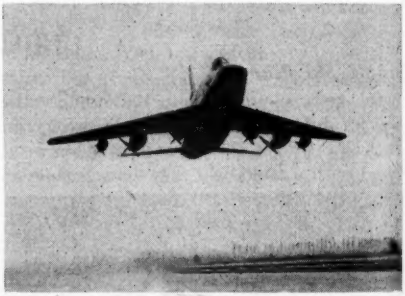
A collapsible rubber bag that resembles a barrel is expected to facilitate the dropping of such equipment as jeeps, bulldozers, and weapons from cargo planes. From 4 to 10 of these air cushions are placed beneath a magnesium pallet carrying up to 25,000 pounds of equipment, and when the load is dropped, a rush of air fills the cushions, before automatically closing diaphragms that keep them inflated. When they hit the ground, compressed air in each cushion bears the brunt of shock then forces out a rubber cork-like plug which decompresses the bag. Tests have indicated that the cushions cut ground impact by two-thirds. With the cushions the airborne forces can drop equipment more economically, by reducing the rigging time of loads as well as the number of parachutes needed for heavy loads. The cushion is made of strong, lightweight nylon tire cord fabric covered with rubber. Strands of steel bead wire reinforce it. It is estimated that as many as 20 safe drops can be made with each cushion.—News release.

Tank Helmet

The development of a new tank helmet designed to afford maximum protection and still allow unobstructed use of tank fire control equipment is nearing completion. The prototype helmet consists of a helmet shell with internal communications equipment. The shell, of 1-piece laminated nylon construction, is equipped with padded earphones, a microphone on a swivel boom, and a toggle-type selector switch at the point of juncture of the boom and left earflap, thus eliminating the chest set. In addition, goggles are being developed for use with the helmet. The goggles weigh less than 3 pounds and will afford adequate bump and ballistic protection.—News release.

Supersonic Carrier

A new long-range "Super Sabre" that can carry an atom bomb faster than the speed of sound has been delivered to the Tactical Air Command. The new *F-100C* has the same capability to fight at supersonic speed as earlier models in addition



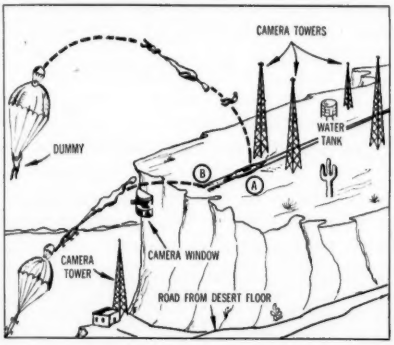
Long-range fighter bomber joins Air Force.

to flying long-range bombing missions. The major changes from the *F-100A* "Day Superiority Fighter" are an in-flight refueling system, provisions to carry extra fuel drop tanks and bombs under its wings, and improved electronic methods of accurately delivering the bombs to a target. The refueling system will permit the plane to escort high-speed bombers on long-range missions or to be used as a fighter bomber against distant targets. The plane is armed with four *M-39* 20-mm cannon and is powered by a *J-57* turbojet engine with afterburner rated in the 10,000-pound class.—News release.

Supersonic Test Sled

Designed to assist in solving the problem of emergency escape from aircraft traveling at supersonic speeds, a rocket test sled has been developed which will duplicate on the ground actual supersonic

flight conditions. Called *SMART*, for Supersonic Military Air Research Track, the new device will permit accurate observations under controlled conditions of the testing of aircraft seat ejection equipment, various types of parachutes, together with the effects of bail-out at supersonic speeds on both equipment and personnel. The *SMART* project is designed to provide free flight for test equipment and its recovery for future use. A rocket propelled "locomotive" pushes the test carriage, which simulates the cockpit of an airplane, at high speeds along the 2.5-mile track. Near the end of the test run (A), in sketch, a dummy is catapulted from the carriage by the seat ejection mechanism. A parachute lowers the dummy to the ground. At (B) the "locomotive" is stopped by a water-braking device and the test carriage is shot off the end of the cliff. A parachute lowers the carriage to the desert floor, 1,500 feet below.—News release.



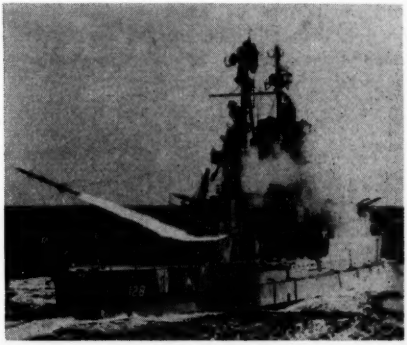
Test emergency devices on supersonic sled.

Deploy Forces

In order to strengthen NATO ground force defense in Italy, a portion of the United States forces now in Austria will be deployed to Italy as NATO integrated forces as soon as the necessary arrangements to receive them have been worked out. The exact location of the units and other questions of a logistic nature will be determined in consultation among Italian, United States, and NATO representatives. The move was necessitated by the coming into force of the Austrian State Treaty which called for the withdrawal of allied troops in Austria.—News release.

Navy Missile

The Navy's newest antiaircraft guided missile, the *Terrier*, is capable of supersonic speeds and can destroy its target under any conditions of visibility or weather. It is far deadlier than even the largest antiaircraft guns and will be the primary armament on the Navy's first two guided missile cruisers, the *USS Boston* and *Canberra*. The Marine Corps has adopted the *Terrier* as its first antiaircraft missile for use in amphibious operations. The new missile is rocket-powered.—News release.



Navy's guided missile takes to the air.

Religious Identification

In the future religious preference of Armed Forces personnel will be spelled out on their identification tags instead of being designated by a single letter. Wherever space limitations permit, the religious preference will be spelled out on the tags and when it is impractical to do this, meaningful abbreviations will be issued. Presently, religious preferences are indicated with the letter "P" for Protes-

tant, "C" for Catholic, "J" for Jewish, "X" for other religions, and "Y" when personnel do not desire to have a religious preference indicated. The new system is aimed at clarifying those faiths in the "P" and "X" categories to assure that chaplains have a clear knowledge of an individual's faith so that appropriate last rites are administered. Old identification tags will not be called in but if an individual desires, he may make arrangements for new tags.—News release.

Short-Gap Bridge

To provide the Army with a method to bridge a short gap in the face of enemy fire, the Corps of Engineers has developed a bridge which can be maneuvered

Tank pushes short-gap bridge into position.

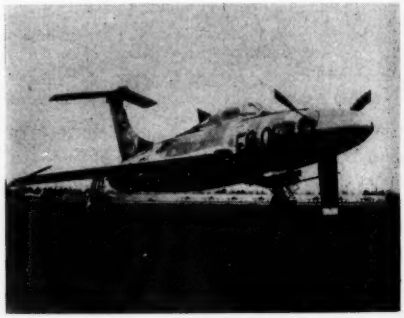
into position by a tank in a matter of minutes. The bridge can span a gap up to 40 feet and is capable of supporting the heaviest United States tank. The bridge is released from within the tank thus permitting this vehicle to cross without exposing the crew to direct enemy fire.—News release.

Sentry Dogs

The Army Quartermaster Corps is looking for 600 German Shepherd dogs which will be trained for sentry duty with the United States Air Force. The dogs are needed in increments of about 50 per month for the next 12 months. The dogs sought are to be from 1 to 2 years old, with males being preferred. They should have a minimum height at the shoulder of 22 inches and a maximum of 28 inches. The dogs should weigh between 60 and 90 pounds and be of an inconspicuous color. They must be physically and mentally sound and not be gun- or noise-shy.—News release.

Experimental Fighter

Designed to test the feasibility of supersonic propeller and turboprop type fighters, the *XF-84H* experimental turboprop fighter plane is undergoing extensive tests. The plane combines the advantages



Turboprop plane undergoes Air Force tests.

of propeller-driven planes with the speed of lightweight modern jet engines. The power of the turbine engine is converted through a gearbox and shafting into propeller power, providing high speed and performance with considerably less fuel consumption than today's jets. This feature would permit a fighter aircraft of the *XF-84H* type to operate over targets for reconnaissance or to remain in a given area to act as an interceptor. The single-seat fighter has wings swept back at a 40-degree angle. An automatic propeller governor maintains constant engine revolutions per minute and speed changes in flight are controlled by automatic pitch change of the propeller blades.—News release.

Weather Station

The development of a complete miniature weather station set which can be held in one hand aboard ship to automatically record essential weather data in total darkness and under severe weather conditions has been announced by the Navy. The device was designed to supplement standard permanent weather instruments under conditions which make it impractical or dangerous to use them. The set weighs about 6 pounds and is 23 inches tall. When held at arm's length for a few moments, the sensing elements of the set quickly position individual dials to measure surface atmospheric pressure, temperature, relative humidity, wind speed, and direction. A lever locks all readings in place for subsequent noting and recording in a sheltered area. An indexing stud assures correct alignment for wind direction measurements. The set is provided with a pintle mount in the handle so that it may be set in place on a pipe support when desirable.—News release.

Nuclear Submarines

A contract for the design and development of an atomic powerplant suitable for a small submarine has been let by the Government. The announcement gave no hint of the size, but it apparently would be much closer to that of the conventional submarine than either the 2,900-ton *Nautilus* or the 3,200-ton *Seawolf*. The average fleet type submarine has about a 1,700-ton displacement. No cost estimate or completion date was announced.—News release.

Rocket Plane

A supersonic rocket plane expected to achieve heights and speeds far greater than any ever attained is nearly ready for test flights according to the Air Force. The aircraft, the first designed to crash the so-called "thermal barrier," is believed to be capable of withstanding temperatures up to 1,000 degrees Fahrenheit. The plane, the *X-2*, is expected to fly before the end of the year. It is powered by a rocket engine which it is said packs the propulsive strength almost equal to that of a modern, 10,000-ton Navy cruiser. A previous model, the *X-1A*, flew faster than 1,650 miles an hour. A mother plane will be used to carry the *X-2* to the altitude from which it will begin its flight, thus permitting the experimental plane to start operations with a larger fuel load.—News release.

Lift Classification

The security classification of "Confidential" has been lifted from *TACAN*, Tactical Air Navigation System. *TACAN* is a short-range—200 nautical miles—omnibearing and distance navigation system which operates in the 962-1215 megacycle band. It provides continuous information to the pilot showing his bearing and distance from a selected ground station. The system was developed under the auspices of the United States Navy to satisfy urgent military requirements for accurate and flexible navigation support of modern carrier- and land-based aircraft. Declassification results from coordinated Canadian, United Kingdom, and United States action.—News release.

Resume Plans

Plans for selection and entombment of the World War II Unknown, postponed in 1950 because of the fighting in Korea, are to be resumed in the near future. The selection and entombment of an unidentified American who lost his life while serving overseas in the Armed Forces during World War II was provided for by the 79th Congress. Whether arrangements for selecting and entombing the World War II Unknown are to follow the plans announced in 1950 will be studied by the Department of the Army, which has been designated as executive agent for the Department of Defense.—News release.

INDIA

Oil Refinery

Plans for an oil refinery which will cost about 31.5 million dollars and have a capacity to process 1,500,000 tons of crude oil a year have been completed at Rajkot by the Government of Saurashtra State and the sponsors of the project. The refinery will be built at Bhavnagar, a port on the Gulf of Cambay. It will refine Iranian oil. The Iranian Government is reported to be willing to invest in the project. The refinery is the fourth in the country and the first to be controlled by Indians.—News release.

USSR

Cut Troops

A 640,000-man cut in Soviet Armed Forces has been announced but it is expected to make little difference in the East-West power balance because so many Russians are under arms. The Soviet Government said the projected manpower reduction was decided upon as another step to lessen international tensions. The cut is expected to be completed by 15 December. The total strength of the Soviet Armed Forces has never been officially disclosed but it is estimated as 3.75 million men with the Army having 2.2 million men, the Air Force 800,000, and the Navy 750,000. It was announced that the men released would be assured of employment at industrial establishments and on state and collective farms in their places of residence. Previously the Soviets had announced a reduction of 44,000 men in their forces. The reductions will take place in the Army and Navy.—News release.

ARGENTINA

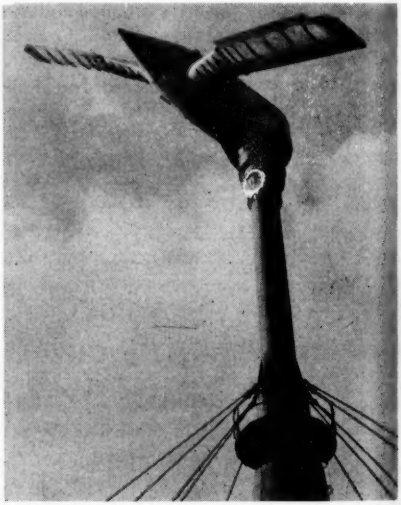
Abolish Commands

By decree the Government has disbanded the high commands of the Marine Corps and the Naval Fleet Air Arm, which in the future will come under the Naval Zones Commands. The decree stated that the forces which are affected will depend on the Command of the naval zones and complementary technical organizations will be incorporated in the corresponding directorates.—News release.

GREAT BRITAIN

Wind and Electricity

The use of windpower for generating electricity is being studied by the British Electricity Authority. A new type of wind-driven alternator was constructed recently in England for the tests. The 80-foot rotor of the electric windmill has hollow blades. The air is drawn up through a turbine at the bottom of a 100-foot tower to the open tips of the blades. The turbine drives the alternator.—News release.



Test windpower for generating electricity.

Proposed Engine

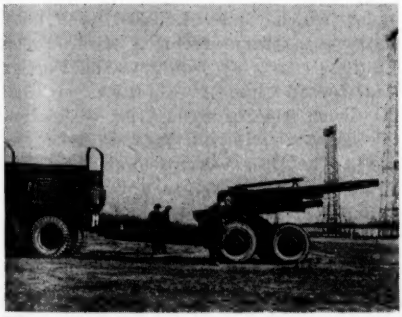
For superior all-around performance, an English aircraft designer has proposed a combination jet and liquid rocket engine. The chief advantage is that the liquid rocket improves with height, while the

power of the jet decreases. It is estimated that at high altitudes a rocket could double the speed of a plane traveling at Mach 1 in a minute or less, an acceleration that would take a pure jet 10 minutes or more.—*Air Training.*

FRANCE

Equipment Development

For a period after World War II, French military equipment was 5 years behind the times because the country's industry and economy were partially ruined, but recently France has made up for those lost years. French industry has not yet solved the problem of quantity and cannot mass-produce all the weapons required by the nation's infantry, artillery, and armored divisions. The French, however, have been successful in solving the problem of quality and have perfected a large number of prototypes. Weapons are being produced in small quantities and certain types of matériel are being delivered to various Army units.



155-mm howitzer fires a variety of shells.

Included in the infantry weapons now being manufactured are a new rifle grenade which has a strong perforating power and an undetectable antitank mine which hurls a cone of small steel cubes capable of piercing .4 inches of armor at a distance of several hundred yards. The 73-mm bazooka, which will go into mass production soon, fires missiles capable of perforating 9.7 inches of armor at a distance of 220 yards. The 65-horsepower French "jeep," known officially as a liaison and reconnaissance car, is similar in shape to the American jeep, but is larger, slightly heavier—2,860 pounds—and more comfortable. It is powered by a 4-cylinder engine with a half-gallon cubic capacity. The vehicle has excellent roadability even when it reaches a maximum speed of 37 miles on uneven ground and 65 miles on highways. The inside of the vehicle is convertible and adaptable to all military requirements. It can be used as a liaison car, an armed reconnaissance vehicle, a 2-stretcher ambulance, a tractor for light artillery or antitank weapons, and a radio or telephone car.

The 13-ton light tank, which mounts a powerful 75-mm gun with a high muzzle velocity, is exceptionally maneuverable and mobile and can be used to great advantage as a tank destroyer. It provides relatively light armor protection for its 3-man crew, but is only 6.5 feet high and therefore difficult to detect on uneven ground. Among the armored weapons still in the prototype stage are the 50-ton heavy tank, the armored full-track cargo carrier, and the 120-mm wheeled mortar. Also being produced is an all-purpose automatic weapon which can be used by infantrymen,

Speedy light tank packs a powerful punch.

either as a light machinegun or as an automatic rifle. There are three models of the weapon all weighing from 20 to 26 pounds.

The French are abandoning the famous "75" cannon of World War I fame and are endeavoring to establish an entirely new system of artillery based on two types of all-purpose guns, the 105-mm and 155-mm howitzers. These are both curved-trajectory weapons, whose vertical-falling shells can hit targets that are concealed or situated on reverse slopes, out of reach of direct fire. They are so constructed that the elevation extends from minus 5 degrees to plus 70 degrees. They have a very wide traverse which permits sudden shifting and concentration of fire. Technical improvements have greatly increased the range of the howitzers and accelerated their firing rate. The 105-mm howitzer is motor drawn and weighs approximately 3 tons. It fires a 35-pound explosive shell to a range of 9 miles with great accuracy. It has an initial muzzle velocity of 1,900 feet per second. A tripod carriage gives it perfect stability in all directions and enables it to attain any angle of elevation without the position of the battery being changed. A semiautomatic breech-loading system permits it to be used as an antitank weapon with an accelarated firing rate.

The 155-mm howitzer, also motor drawn, uses two types of shells. One is a long-range shell weighing about 100 pounds and having a range of 11 miles, while the other is a high-explosive shell with a range of 10 miles. It can fire the United States 155-mm shell as well as special shells designed for use against reinforced concrete or armor plate. It is mounted on a gun carriage with two fixed and two movable trails. There are also self-propelled versions of these two guns. The 105-mm version on caterpillar tracks is mounted on a tank chassis driven by a 300-horsepower engine. It weighs a little over 13 tons and can be transported by plane. Because of its maneuverability and exceptional mobility, it is seen as a support weapon for airborne operations. Armament engineers have been working with recoilless weapons, and have developed an exceptionally light 75-mm model. The barrel weighs about 150 pounds and its tripod carriage only 44 pounds.

It is planned to equip one French division entirely with French developed weapons.—French Embassy-Press and Information.

CHILE

Maritime Frontier

Colombia and Costa Rica are expected to join shortly the tripartite agreement under which Chile, Ecuador, and Peru claim a maritime frontier of 200 miles off their coasts according to the Foreign Ministry of Chile. If Colombia joins, all the South American countries with a Pacific coastline will be a party to the agreement. The United States and Great Britain refuse to recognize any sovereignty claims over ocean waters beyond the traditional 12-mile zone.—News release.

ITALY

Ground Support Plane

Under the NATO mutual weapons development program, Italy has been given permission to start producing a ground support aircraft, the *G-91*. This plane is a light jet with relatively cheap construction costs. It will be powered by a British engine.—*Air Training.*

POLAND

Vehicle Production

By the end of the current year Poland expects to be producing 25,000 trucks, 12,000 passenger cars, and 32,000 motorcycles annually. To speed the development of the automotive industry in the country, it has been reported that the Soviet Union delivered the entire equipment for two plants to Poland and permitted her to manufacture 2½-ton trucks and cars. In

Lublin a factory produces trucks along the design of the Soviet *SIS* truck. This plant possesses the most modern Soviet equipment. Originally it was an assembly plant but gradually individual production departments have been added. Today the majority of the parts are being manufactured in Poland. At Zeran the *Warszawa* passenger vehicle plant manufactures cars based on the *Pobeda* type. All personnel at this plant have been trained by Soviet instructors. Last year about 20,000 *SBL* motorcycles were produced and this year an additional model, the *Junak*, is expected to be added.—*Wehrtechnische Hefte.*

AUSTRALIA

Dog Paratroopers

The Army expects to have a number of dog paratroopers for use on patrol duties with Australian troops. A course of training, including parachute jumping, for the dogs and their handlers has been established at the School of Land-Air Warfare. The dogs have been trained in patrol duties and are now being taught to jump from aircraft and parachute to the ground. They are fitted with a special harness. Details of the training of the dogs came from experience gained in Korea and Malaya. There are several types of dogs trained in patrol work, mine detection, and guard duty in the Australian Army. It is also planned to use the dogs for scouting, cable laying, and message carrying.—News release.

Submarine Detector

A newly developed device for locating submarines at all depths under the sea has been fitted to Royal Australian Air Force *Neptune* bombers, and is reported to have given very satisfactory results in recent maneuvers. Before being armed with the new device, the *Neptunes* could detect submarines only when their periscopes were showing or when they were on the surface. Details of the device were not revealed.—News release.

Test Ration

A new Army emergency ration which includes bacon and eggs has been tested successfully by Australian soldiers in New Guinea. The men finished a 10-day test with food to spare. Other items in the ration pack are block chocolate, cereals, meat, and fruit.—News release.

Enlarge Airfield

Because of the expanding weapons research program, Edinburgh Airfield, Salisbury, South Australia, center of the flying activities of the Australian Weapons Research Establishment in conjunction with the Royal Australian Air Force, is to be enlarged. A 4-jet intercontinental bomber will arrive in Australia soon for trials at Woomera Range and a special giant-size hangar will be required to house it. In addition to the hangar, improvements will include installation of the latest control room facilities and more taxiways.—News release.

New Trainer

The first aircraft to be designed and produced in Australia to Royal Australian Air Force specifications is to be used for the training of pilots. Known as the *Wingeel*, the aboriginal name for a young eagle, the plane has a maximum speed of 180 miles an hour. It is to replace the *Tiger Moth* elementary training aircraft and the *Wirraway* basic trainer. Pupils will do their initial training in the *Wingeel* before going on to jets. It has an all-up weight of 4,235 pounds.—News release.

Safety Aid

During the past 2 years Royal Australian Air Force control towers throughout the country have been equipped with automatic direction-finding apparatus which makes for greater safety in the air by giving more control to the man in the tower and greater security to the pilots under his control. This brings the RAAF

into line with overseas standards of aircraft control. When the pilot calls the tower on his very high frequency channel, instantaneous bearings are given on the cathode ray indicator. Even before the pilot begins to speak, the carrier wave of his set is sufficient to indicate a bearing to the ground controller. If needed in emergency, the tower controller can give a course to fly by merely flicking a switch. The direction-finding equipment operates on a special frequency and is monitored at all times when aircraft are in the air. When aircraft are forced down away from the landing strip, search procedure will be helped greatly when the plane is in contact with the tower.—News release.

WEST GERMANY

Simplified Jet Engine

The German Experimental Station for Aviation (*DVL*) is sponsoring a program to develop a new type of jet engine incorporating principles of the *V-1* and *V-2* rockets. It was explained that engines working on the principle of pure ram-jets or of the Schmidt pipes have propulsive units containing only a few or no movable parts. Because of their simple construction they will avoid many interference factors and be far cheaper to manufacture.—News release.

AUSTRIA

Return Refineries

The rich Zistersdorf oilfields, 28 oil refineries, and 319 factories, held since the end of World War II by the Soviet Union, have been returned to Austria. Also turned back were 234,000 acres of farmland which the Soviets had seized. All these properties were taken under the 1945 Potsdam agreements with the Soviets claiming that they were "German assets." The properties were returned in accordance with the Austrian independence treaty signed recently. It provides for Austria to buy them back at the price of 150 million dollars in goods and delivery of 10 million tons of oil to the Soviet Union within 10 years. The annual capacity of the four oil regions around Zistersdorf is now about 3.5 million tons. In addition to the 1 million tons of oil which she must supply the Soviet Union annually, Austria hopes to export at least 1 million tons a year to the West for currency purposes.—News release.

HUNGARY

Aluminum Industry

With the addition of new processing units at the Ajka Aluminum Oxide Works and Reduction Plant, aluminum production will be up 300 percent over that of World War II. In 1954 the plant produced 35,200 tons of the valuable metal. During the current year it is planned to invest approximately 14 million dollars in the plant. The plant, one of the country's newest establishments, was opened in 1951. Ajka is located in northern Transdanubia and is an important center of the aluminum industry.—*Wehrtechnische Hefte.*

SOUTH AFRICA

Select Plane

The *Sabre 6*, a high-altitude interceptor which can be converted to carry various combinations of heavy armament for ground attack, has been selected by the South African Defense Headquarters as the plane with which to start re-equipping the South African Air Force.—News release.

ROMANIA

Keep Troops

Soviet troops will remain in Romania until United States forces quit Western Europe and Western military alliances are dissolved it was announced recently. The report said that the Soviet soldiers would remain to assure "Romania's security" in accordance with the Warsaw military alliance the Soviet bloc signed last May.—News release.

FOREIGN MILITARY DIGESTS

The Geopolitical Basis of Modern War

Translated and digested by the MILITARY REVIEW from an article by Major T. Hammer in "Norsk Luftmilitaert Tidsskrift" (Norway) April 1955.

GEOPOLITICS as the name indicates is the relationship between geography and politics. Geopoliticians hold that international relations and, therefore, internal conditions—since a country's foreign policy is of necessity a function of its internal conditions—are governed by geographic factors. Political ideologies with which we are so deluged in our day and especially moral concepts, have little influence on international policy.

This fact may be easily corroborated by historical examples, and if by chance one attached little weight to history and is of the opinion that the policy of our time relative to power has no historical precedence, it can be shown easily by examples from our own time. However, before we consider the foreign policies of our own time from the geopolitical point of view, it is necessary to go back to the era when geopoliticians discussed mainly landpower and seapower, for in our day the third element, airpower, has acquired decisive importance and its influence on international relationships can hardly be overestimated.

Geopolitics began to be seriously discussed at the turn of the century. In 1904 the famous British geographer, Sir Halford J. Mackinder, read a paper before the Royal Geographic Society which he called, "The Geographic Pivot of History." He argued that Europe's historical development had resulted from that of Asia and that modern Europe was the product of resistance and reaction to pressure from Asia. This pressure from Asia had been manifested in the form of invasions ever since the days of the nomads. It culminated in the Mongolian invasion of the third century. All the invasions came from the central land mass of eastern Eurasia, a region which constitutes almost half of the total land area of the globe. This region comprises the Asiatic portions of Soviet Russia: Siberia, Sinkiang, Mongolia, and a few regions of the Far East. On the north it is bound by the Arctic Ocean and on the south by Turkey, Iran, Iraq, and Tibet. Mackinder called this region the "heartland," and attempted to show that the power that controls it will also enjoy the most favorable conditions for controlling the remainder of the globe.

Historical and Geographic Review

In historical times the "heartland" was difficult to reach by land because of the great distances involved and was entirely inaccessible by sea. It remained isolated to a great degree from the economic development which took place in Europe. The constant pressure from the east had, however, an integrating effect on European culture, and since central and western Europe geographically did not present such difficulties in the way of natural traffic routes and distances, it was here that the greatest economic and cultural development took place. In addition, western Europe, which Mackinder called the coastland, had the sea as a traffic route with its strong influence on commerce. In contrast, the "heartland" was immune to attack by a seapower, among other reasons because of the Arctic Ocean, and consequently possessed a strategic advantage, while its natural isolation hindered its development. Its great distances also imparted to it a strategic advantage with respect to invasions, an advantage which the Russians skillfully employed several times during the course of the nineteenth and twentieth centuries.

It was, therefore, western Europe which, with the help of commerce and seapower, reduced the "heartland's" strategic advantage and caused the balance of power to swing in its favor. The threat from the east was, nevertheless, latent.

History to Mackinder was geography in motion. He regarded Europe, Asia, and Africa as one world island and Africa as the southern "heartland" still untouched but full of possibilities. He regarded the American Continents as minor world islands, full of possibilities, to be sure, and future strategic heartlands. He believed, furthermore, that the greatest historical breaches of relation had been between coastal and continental peoples. All things considered the advantage had been on the side of the coastal peoples. This, as we have mentioned before, had resulted from the fact that developments had progressed more swiftly here and that population increase was more rapid. From time to time invasions occurred followed by changes, but the continental peoples' domination was of temporary character, primarily owing to the sparseness of the population in the interior regions. However agreed we may or may not be with regard to the theory of war between coastal and continental peoples, we must, nevertheless, concede that the increase in Europe's population during the last three centuries, stimulated by commerce, marine transportation, and industry, has constituted the principal factor in European national expansion and the founding of colonial empires. A steadily increasing reaction has been exhibited, however, by the racial types other than Caucasian. At the same time the standard of living and of industrial development that has been achieved in Europe has caused great need for the natural resources of the Asiatic and African areas. It is not, therefore, merely territorial and constitutional demands that form the basis for the hostility of these other racial types, but their own need of their national resources—and this will have a considerable effect on the social conditions of the West.

Land versus Seapower

Mackinder was of the opinion that seapower, on which the British had long based their leadership, was no longer of such great importance, since central Asia, where the possibilities for the future were the greatest, was inaccessible to seapower; nor was it dependent on it. Furthermore, he believed that the network of bases which England had painfully built up and upon which her seapower was based could, after all, be outflanked and seized since land mobility had increased. He tried to impress his fellow countrymen with this danger at the beginning of this century

to get them to turn their attention more to landpower. He perceived clearly the "heartland's" possibilities and reasoned that England must never permit a continental power to subjugate it in order to use it against the Empire. Especially was he concerned over the ambitions of the Germans in this respect, but it is quite apparent today that he completely underestimated the Russians' possibilities of becoming masters over the area in question. At that time the power relationship between the Germans and the Russians was far different from what it is today and in favor of the former. The Germans' dominant position in central Europe and their steady effort at expansion were a cause of wars later. Their policy, which certainly aimed at damming up the strength of the population and preventing it from finding a natural outlet by means of emigration, taken together with their great industrial enterprise and national ambitions, have led them into war several times. Thus far the Germans have sought a decision by the aid of arms, but this has not been the only possibility open to them. Economic infiltration, in the opinion of some Germans, was a surer method. General Karl Haushofer, Germany's famous geopolitician, was inclined to the view that economic infiltration of the "heartland" would be a safer course for the Germans than military conquest.

There was also a latent danger in the possibility that the Germans and Russians would join forces and thereby become powerful enough to dominate all of Europe and eventually the world. Now, in our day, we have NATO and the West's flirtation with West Germany based on the danger that the Soviet Union could come to control all of Germany, and join the latter's productivity and resources with her own, thereby outweighing the lead of the West. The problem still exists, but part of the factors have changed, since the Soviet Union is in a state of furious development, and it is only a question of time when her power will be able to measure itself with that of the West—regardless of the Germans.

Development

Since the close of the nineteenth century development has been progressing at an increasing tempo because the Soviet Union, which is virtually the eastern European-Asiatic "heartland," has built a number of railway lines toward the Far East. The first growth began in the time of the Czars with the Trans-Siberian Railway to Port Arthur. After the Revolution in 1917 there was a great change in the Soviet Union, with main stress on heavy industry consequently increasing military potential with this development. This upswing was known to the world through a series of 5- and 10-year plans, but it was not generally understood to what degree efforts were turned toward developing the interior regions behind the Urals. At the same time a ruthless removal of populations to the interior regions was accomplished. Vast agricultural projects were carried out without regard to whether they would be profitable within a reasonable length of time. It was long-range work the Soviets were engaged in and the time factor has never had the same meaning to the Russians as, for example, to the Americans. A great and comprehensive change has taken place. The Soviet Union has the largest land area on the globe as a basis for her world ambitions and is able, independently of the West, to organize and exploit it and to choose the time for the final decision.

To what extent her efforts have been crowned with success was evident during the last war when the Germans, after having occupied virtually all of European Russia, were far from having seized possession of the new sources of the Soviets' productive strength and manpower. As another example of the radical change

that has taken place in the Soviet Union, which shows that from being a relatively undeveloped country she has become a leading industrial nation, we may cite the production of the atom and hydrogen bombs. To be sure, she received information from spies, but the industrial effort which had to be made was her own.

Taking into consideration the great damage she suffered during the war, the results are the more amazing. In the West it had been calculated that the Soviet Union would be able to manufacture atom bombs by 1956 to 1958, and this estimate was based on the effort it had had to make. In 1949 the first Soviet atom bomb was exploded and in 1951 the first Soviet hydrogen bomb. The conclusions are obvious. Industrial expansion in the Soviet Union is much greater and is spreading at a much more rapid pace than had been assumed. The lead which the West has over the Soviet Union is steadily becoming smaller. A modern and productive society exists today in the central "heartland." The Communists have shown great geopolitical foresight and are, therefore, more dangerous. The Soviet Union's present position and strength constitute the fulfillment of the Western geopolitician's bad dreams. She controls the greatest land mass and possibly the greatest resources in the world. The time factor appears to work in her favor. Strategically she cannot be attacked by and is invulnerable in the face of seapower. She is far stronger on land and her resources in point of manpower, especially since the establishment of the Moscow-Peking axis, are enormous. If this situation had existed in the previous century, her leadership would have been indisputable and she could, in peace and comfort, have set about building fleets for the defeat of the Western nations on the seas. In the meanwhile a new element, airpower, has come into being, and in the face of this factor she is more vulnerable. Before we discuss this, however, it is necessary to examine a bit more closely the influence of seapower in general.

Seapower

Seapower has had advocates of as great authority as was Mackinder for landpower. Too much space would be required to present a résumé of all the famous personalities who through the years have occupied themselves with seapower as an instrument of national policy, but the American Admiral Alfred Mahan occupies a special place. During the period from 1890 to 1914 he exercised a strong influence over the doctrines relative to naval warfare. In his eyes seapower had been the most significant factor in history. He held that control of the seas for military and commercial purposes had been decisive in all wars since the seventeenth century, and that seapower was superior to landpower as an instrument for the exercise of national strength. The unity of the seas and the mobility of the ship made seapower the most flexible instrument both commercially and militarily. He believed that the following factors were of decisive importance in the development of seapower:

1. Geographic location and physical conformation.
2. Size of territory.
3. Population and national character.
4. Executive policy.

Admiral Mahan had a strong influence on American naval policy and long before World War I he foresaw that the United States possessed the very best prerequisites for becoming a first-class seapower. Great Britain was, it is true, definitely the greatest seapower at that time, and since there existed a traditional friendship between the United States and Great Britain, it was not necessary for the United States to possess as powerful a fleet as Great Britain's. Seeing that the British strength was lost in the last two world wars, the

United States has now become the dominant seapower, and is still on the best terms with her closest ally. What is especially to be noted is that the combination of the two nations gives the West great superiority on the seas. The Soviet Union is already the second greatest seapower in the world. If there are still some who doubt that the Soviet Union has ambitions of world domination, they should remember that she is not dependent on seapower for normal development, either commercially or militarily.

There may be differences of opinion regarding the extent to which seapower has possessed superiority over landpower as Mahan holds. Nevertheless, it is a fact that for centuries Great Britain built up her empire and defeated all rivals with a minimum of military landpower but a sovereign fleet. It is quite true that she was obliged to ally herself with various landpowers in order to conquer Germany, but these are examples from our own time and do not really militate against Mahan's theories with their historical background. The tendency appears to be, however, to accept Mackinder's view: landpower has become more mobile and this reduces the advantage of seapower. To continue the argument a step further: seapower could not have been used against the Soviet Union to any particular advantage; neither was the Soviet Union's landpower able to threaten Great Britain although it exerted a strong pressure in India in the 1890s.

As is apparent there has been a form of specialization among the nations. This specialization results, among other things, from geographic conditions. Every nation is bound in two ways to the territory it occupies. Regardless of the degree to which it depends on commerce it is, in the first place, dependent on the products which the country can produce and, in the second place, it must protect the country against hostile-minded neighbors. The two ideas named here are usually grouped as economic and strategic.

Economic geography deals with the processing and distribution of a country's products and strategic geography with the broader topographic conditions influencing attack and defense. These two ideas are, however, closely interlinked since defense is the protection of the country's economic existence, and distribution of a country's products follows the course where it meets the least resistance, thus preparing the way for a strategic drive.

It is obvious that economic and strategic geography are connected with one another and strongly influence international relations. Geographic and economic factors, in the final analysis, will shape a nation's political attitude and character and, therefore, also its ideologies and degree of modernity.

Airpower

The unity of the seas has been mentioned previously and we can equally well speak of the unity of the air, but while land and sea create difficulties for or channelize transportation, the air gives free opportunities in all directions. It has opened up entirely new perspectives and it is worth our while to see whether the theories regarding landpower and seapower continue to be applicable.

Examination shows that this third element has acquired such overwhelming significance that major operations on land and sea cannot be carried out without, at the same time, having control of the air, so that the one party may use it for his own military operations while preventing the enemy from using it for his.

It would require too much space to discuss airpower in detail, but a few examples of basic nature will be given.

Great Britain found at the beginning of the war that while she still had control of the seas and was untouched by land invasions—a combination which many

times before had given her victory—she was now exposed to serious attacks from the air. Furthermore, German aviation made it difficult for her to operate in her own waters. England's traditional weapons were insufficient. While she was able to retain her control of the seas, the homeland stood in danger of being destroyed from the air. She altered her strategy, therefore, and gave first priority to aviation. The foresight and insight the British displayed with regard to the possibilities of aviation in lifting it out of the category of merely a support weapon for land and naval forces is amazing.

In the United States, which had not yet entered the war, the changes which had occurred caused aviation to be accepted on the same footing as landpower and seapower. This resulted among other things in a series of foreign political moves aimed at procuring airbases for the United States in other countries. Treaties were signed with countries in Central and South America, with Canada, the United Kingdom, and Iceland for the construction of intermediate airfields so that flights to Europe could be undertaken on a large scale. Support was hereby given to a policy regarding airbases that has been characteristic of the United States postwar policy and which has now completely changed the Soviet Union's and the "heartland's" historical immunity to attack from without. Quite aside from having changed the character of war itself, airpower has changed the geopolitical conditions which gave the Soviet Union her greatest strategic advantage. It works both ways, that is quite true, but at the present time, in any case, the aviation of the Western Powers is far more highly developed and experienced in strategic bombing than that of the Soviets, and this constitutes the greatest strength of the West.

The Soviet Union is open to air attack from all sides and the periphery that has to be defended is greater than that of the West. To be sure, her great area offers numerous possibilities for the dispersion of vital industries, but her transportation system is little developed and overloaded. Her industrial capacity is strained to the utmost by the simultaneous maintenance of a standing army of 175 divisions, the largest air force—quantitatively—in the world, and the construction of a large fleet. Concentrated attacks with atomic weapons against her key industries in the smaller areas will produce a greater effect than similar attacks against the United States where a large number of the industries are equipped for civilian production but can be changed over at the outbreak of a war. In addition, the transportation system of the United States is far more highly developed than that of the Soviet Union and reconstruction and reorganization after an atom bomb attack would proceed much more rapidly. Finally, and the most decisive factor in the United States favor is the fact that the latter's industrial potential is greater than that of the Soviet Union. The resources of Western Europe added to those of the United States make NATO far stronger today than the Soviet Union in all the essential industries such as steel, coal, power, and oil production. The resources of Europe under Soviet control would, however, alter the picture, and we come here to the most important geopolitical and geostrategic condition for NATO as seen from the American point of view. Western Europe's ideological fellowship with the United States is a factor, but it is far from being as significant as the geopolitical and geostrategic. This is not spoken of so much in the press, but presumably it would not produce the desired reaction from the people either.

The great question is, to what degree can airpower take over the role of seapower and make it possible for Europe,

with American aid, to dam up the pressure from the East? The answer seems to reside in how far the economic development and expansion of the West can be held in advance of that of the Soviets. In other words: Can the present status be maintained in spite of developments in the "heartland"?

Geopolitical Prerequisites

In modern war the outcome, broadly speaking, depends on manpower, food supply, supply of raw materials, industrial capacity, and technological development. To this is added geographic conditions.

As regards manpower, this is a factor whose significance is beyond question, but the use of manpower can vary. Up to now the best of the manpower has been used, to a great degree, in uniform. Manpower is also of vital significance in industry and agriculture. In order to keep a modern military machine and society functioning at the same time, *more people are needed back of, than in, the lines*—to use a well-known expression. The development of the Soviet Union and the question of when she will be able to engage in the battle with the West, is also essentially a question of manpower. Since, as is known, the production of the Soviet worker does not come up to that of the Western worker, relatively more persons will be needed in the Soviet Union to produce, let us say, a given number of planes. Although the Soviet Union has incorporated a large number of people from lesser areas, she has not increased her manpower in point of skilled labor. Such persons require a great deal of training to be of use in industry, and the Soviets have instituted great efforts in this direction. We here find ourselves dealing again with the time factor, for the populations in the West are also increasing. The Soviets' incorporation of a number of European states constitutes a temporary increase of both manpower and production, but this form of conquest without war is now at an end and the final result will depend on what happens in the Soviet Union herself. As is well known, a policy which favors the family is pursued in the Soviet Union, but with increased industrialization we have reason for assuming that the populations of the cities will become stabilized, as has been the tendency in the West.

Manpower, the factor which both Mackinder and Mahan took particular account of, is therefore constant. The way in which manpower may be used, however, varies. It is of interest to mention here that the United States "new look strategy" has been characterized by "more airpower—more firepower—less manpower," that is, less manpower in uniform and more in industry. Seeing that the new superweapons are coming into use and conventional armies are losing their great role, it is probable that this will continue to be the case to a steadily increasing degree.

Food supply has been a big problem in the Soviet Union. The collectivization of agriculture has proved to be unpopular among the farmers, and production has not shown the planned increase. An effort has been made to halt this state of affairs by terrorism and the shifting of stubborn populations. Great agricultural projects have been put into operation, but according to data that has been published and which there are no grounds for doubting, the increase in food production has far from kept pace with increase in population. Food production in Western Europe, the United States, and Canada is far greater than in the Soviet Union. As far as industrial capacity is concerned, this is to a great degree dependent on human energy. It has been asserted that the climate in the Soviet Union is so rigorous that a disproportionate amount of human energy is used up in merely maintaining existence and that, therefore,

the energy that is left over for creative work and development is less than in the West.

In regard to equipment for modern technique and mechanization, there exist no grounds for doubting that the Russian race possesses natural qualifications for exploiting the great source of national wealth with which it is endowed. The time has passed when the Soviet Union can be looked upon as an underdeveloped area. On the contrary, we must recall the United States own rise as an industrial nation to find a parallel. There is no indication that the Soviets lack originality in technical and scientific fields although many of their products have been strongly influenced by the West. That they have several times imported outstanding persons from the West indicates openmindedness to new influences as much as it does a lack of ability to keep pace with the West, as has been often alleged.

Conclusion

As we have stated previously, geography is a very great factor. Thus far it has been held that its principal advantage lay in the fact that "time could be bought with space," and that great land areas favor the defender more than the attacker. This idea should be examined in the light of the developments of recent years. Historically the foregoing assertion was justified. Napoleon and Hitler's campaigns in the Soviet Union are such striking examples of this that we shall omit detailed reference to them.

It is well known that mobility on the ground and in the air has rendered distances superable and that the Soviet Union's immunity to attack has changed with the advent of the long-range bomber. The Germans who possessed no great land areas developed the principle of the blitzkrieg for overcoming their geographic handicap. For them it was necessary to strike quickly in order to win victory before their adversaries could mobilize their resources. They did not possess the resources necessary for land war. In both world wars they came close to winning in the early stages, but lost both times since the war was protracted. It was a time factor based on geographic conditions added to insufficient manpower that was their downfall. Geographic conditions acquire a new significance in addition to this, however, with the use of atom or hydrogen bombs. The powerful effects of these weapons, both at the moment of their explosion and the period of dangerous residual radioactivity, make deployment over large areas both a military and social necessity. It is obvious that countries such as England and Germany have had their strategic positions definitely worsened under such conditions. They do not have the necessary room for the dispersion of their populations or installations for making them capable of absorbing such attacks. It is in the light of these facts that we can see Great Britian's heavy investments and developments in central Africa as a future base for her military power in case the homeland is "neutralized." For the same reasons we can hardly imagine a German aggression in the future of the types to which we have become accustomed.

While we are now dealing with geography, there is still another side that must be mentioned. In order to compensate for this, the great powers attempt to push their bases and radar-warning nets out so that they can obtain an earlier warning of an attack. The Soviet Union with her great land area and many barren stretches, continues to have many advantages. The Americans push their bases ahead to Newfoundland, Greenland, Canada, and Iceland in order to have earlier warning.

Geographic conditions and territorial expanse have acquired new significance and are equally important to attacker and defender.

Electronic Countermeasures as a Weapon of War

Digested by the MILITARY REVIEW from an article by Wing Commander K. Narasimhan in the "India Air Force Quarterly" January 1955.

ELECTRONICS, covering the entire field of radio and radar, played an important role in World War II. Radio communication became the lifeline of the armed forces of both sides. Radar was used extensively by all three services of the belligerents and was claimed, quite rightly, as the single development since the airplane, which more than anything else had changed the face of warfare. Radar which was originally developed for obtaining early warning of the approach of hostile aircraft was soon adopted for providing navigational and blind bombing aids. Radar had become such a potent weapon that the warring nations started using countermeasures to nullify its effects. The electronic war between the opposing sides became a war of wits and scientific effort to attack the effectiveness of the enemy's equipment and at the same time protect one's own from his efforts to nullify it.

The electronic countermeasures were mainly directed against navigational and blind bombing aids and all types of radar equipment.

The purpose of this article is to describe some of the electronic countermeasures that were employed during World War II and to discuss them as weapons of war especially in the age of guided missiles.

Electronic Countermeasures

Electronic countermeasures were used by both sides during World War II against radio and radar navigational and blind bombing aids, early warning radar, fire control, and fighter control radar. The radio and radar equipment could either be jammed or skillfully interfered with to render it ineffective. In radio jamming, the direct signal from the equipment is made unintelligible whereas in radar jamming the reflected signal or the echo is made obscure on the face of the cathode ray tube.

Radio Countermeasures

Great Britain first resorted to radio countermeasures in 1940 when the Luftwaffe bombers bombed targets in the United Kingdom by night using radio navigational aids installed along the continental coast. The Luftwaffe bombers used medium frequency and high frequency intersecting beam aids, similar radio range, and finally a radio aid similar to the British *Oboe*. The transmissions from these aids were received in the United Kingdom and were retransmitted in perfect synchronization. The German aircraft and ground operators got two different signals which made their direction-finding apparatus give wrong bearings.

As a result of this the German bombers dropped their bombs wide of the target. Their navigation systems were rendered useless to the German aircrew, many of whom lost their way on the return journey and crashed due to lack of fuel. Some even landed on English airfields thinking that they were in France. Due to heavy losses the German Air Force practically gave up bombing of England by early 1941. When the Royal Air Force intensified its bomber offensive in 1943, the British confused the German fighter pilots by radio telephony transmissions from the United Kingdom, giving them bogus instructions to land, and reports of deterioration of weather. These transmissions combined with different instructions from their own controllers made the German pilots lose faith in their control system and they were unable to intercept the main bomber stream efficiently.

Radar Countermeasures

The pulse transmission from a radar set can be heard at long range, much farther than the greatest range at which it can detect an object. The exact location of the pulse can be determined by direction-finding apparatus. The reflection or echo from the object is normally weak and very little power is required to jam the echo. Before a radar set can be jammed, it is necessary to know its frequency, characteristics, and employment by the enemy. The sources of such information are secret agents, capture of enemy equipment, and monitoring stations of these agents; the last is the most reliable.

In order to monitor enemy radar stations, one should have a large number of receivers and associated equipment covering the entire frequency ranges used in the radar field. Some of the equipment should be light enough to be fitted in aircraft and ships. Once complete information about enemy radar equipment is available, it could be jammed by either mechanical or electronic means.

Metallic strips called "window," cut to the proper wave length of a radar set, when dropped from the air, produce echoes on the cathode ray tube of the set which are similar to aircraft echoes. The "windows" are particularly effective against radar sets which have plan position indicator presentation, and clutter up the tube with echoes which make the distinguishing of the target echo from the rest almost impossible. The density of the strips required to produce an echo similar to an aircraft echo and the optimum density of packages of strips which have to be dropped to produce echoes at all ranges and in all directions in order to render a radar set ineffective depends on its beam width, pulse width, receiver design, and form of presentation. The higher the frequency of the radar set, the greater the quantity of the "window" strips that have to be dropped to neutralize it. Normally the rate of fall of the strips is about 250 feet a minute and the effect lasts about 10 minutes. It was estimated that the United States Eighth Air Force dropped over 10 million pounds of these over Europe during World War II.

The "window" was used extensively during World War II against German radar not only to jam it but also to interfere with it so as to simulate false raids. The Royal Air Force employed an entire group to carry out "spoof" attacks to outwit German radar. A small number of aircraft dispersed in space over an area equal to that occupied by the main bomber force dropped "windows" which produced the same effect as the main force on the cathode ray tubes of the radar sets. In the meantime the echoes due to the main bomber force also appeared on the tubes and the Germans were left guessing as to which of the raids was the correct one. This resulted in dispersion of night fighters and consequent reduction in bomber losses. Many variations of "spoof" methods were used and they succeeded not only in blinding the enemy radar but also deceived him as to the real intentions of the attacking bomber force.

Electronic jamming of radar can be done by continuous wave, modulated continuous wave, frequency modulation, and noise modulation methods. Of these the last method is the most effective. The problems of electronic jamming are many. In order to reduce the number of transmitters and receivers required, each should be capable of being turned over a wide frequency range leading to design difficulties. They should have sufficient power and be light enough to be carried in aircraft if necessary. The best known American jammer was the "carpet" which operated on the same frequency as the German flak control radar. It transmitted noise which filled the radar tube with "grass" or reflectors, obscured the aircraft echoes, and led to inaccurate fire.

Apart from jamming, many other methods were used by the Germans to reduce the effect of enemy radar. German night fighters were fitted with receivers to enable them to home on to H_2S-fitted Royal Air Force bombers from ranges up to 50 miles. This system forced H_2S silence and was proof against jamming as it effected both sides equally. Radio wave absorption materials when coated on aircraft or other objects cut down the range of their detection by radar. Such camouflage methods render the equipment bulky, provide protection only over a small range of frequencies, and reduce the speed of the objects that are camouflaged.

Radar Counter Countermeasures

The effectiveness of radar countermeasures depends entirely on the efficiency of measures to counter it. Throughout World War II the German antijamming devices were not very effective against the mass scale of Allied jamming. Radar sets working on microwaves normally have narrow beam width and short pulse width. These factors automatically cut down the effect of jamming as it is possible for the sets to see through the gaps in the interference pattern. The reduction of band width of intermediate frequency of the radar receiver reduces the effect of broad band noise interference. The Intentional Jitter Jamming Unit, when fitted in radar sets, makes the actual target echo stationary on the cathode ray tube and the jamming signals wander over the trace.

When it is impossible to reduce the effect of enemy radar jamming, an automatic jammer hunter can be used to discover the frequency, range, and direction of the source of jamming. This information is passed on to friendly aircraft for the physical destruction of the jammer. Another method is to set up a number of decoy transmitters at scattered points to simulate a search radar set and thus divert the attention of the enemy jammer. Availability of a number of radar sets which operate on widely separated frequencies and different principles provides a certain amount of protection as it would be difficult to jam all the sets at the same time.

Effort Required

In 1943 the Royal Air Force resorted to the offensive use of electronic countermeasures in a determined manner to defeat the German defensive system which had become so efficient as to inflict serious casualties to its bombers operating at night. The use of radar navigational aids to achieve concentration in time and space alone was not sufficient. A special group was formed and its heavy aircraft were fitted with special countermeasure equipment while its light aircraft were fitted with forward and rear radar equipment to search and destroy the enemy fighters.

Each component of the German Air Defense system, namely the early warning radar, fighter control radar, fighter air interception radar, flak radar, and finally the radio telephony 2-way channels between the controller and the fighters, came in for separate treatment by this group. The electronic countermeasure required quick and accurate intelligence about the frequencies and characteristics of the enemy radar. Hence, aircraft fitted with monitoring and jamming equipment flew far into the enemy territory to discover, identify, and jam his radar. As the enemy changed his frequencies and spread them over a wide band, the jamming effort had to be increased considerably. The enemy's change of equipment automatically resulted in corresponding change in Royal Air Force countermeasure equipment and new tactics had to be developed involving delays which were of advantage to the enemy. In order to reduce its bomber losses in night operations, the Royal Air Force had to keep on continually increasing its electronic countermeasure effort from 1943 onward, and by the end of

the war it had employed about 10 percent of its bomber force on this task alone. The special group which had five aircraft in 1943 had increased its strength to six heavy bomber and six fighter squadrons besides training and development flights. At the height of operations the group employed as many as 100 aircraft a night.

The Royal Air Force effort, supported by an American *Liberator* countermeasure squadron, was found to be inadequate as the "spoof" methods needed constant alteration and progressive elaboration in spite of comparatively inefficient German countermeasures. Had the Germans been able to follow the Allied lead in microwave technique, then the Allied countermeasure effort would have resulted in a considerable proportion of bombers being used to support the actual bomb droppers.

Production Considerations

Considerable research and development is required for the production of efficient radar and effective countermeasure equipment. The British scientists realized this fairly early in the last war and had set up three research teams for each radar project. One team developed new radar equipment while the second devised countermeasures against it. The third team evolved counter countermeasures to minimize or nullify the effect of countermeasures. The time factor is the main consideration in the preparation of counter and counter countermeasures if they are to save aircraft and lives of aircrew. The equipment has to be designed, built, air-tested, and manufactured in small quantity as quickly as possible. Then highest priority is essential for the mass production of the equipment. The research, development, and production machinery should be capable of producing a wide variety of radar equipment operating on widely different frequencies and principles if a country is to retain its initiative in electronic warfare.

The United States, which had a fairly well-developed electronic industry before World War II, spent 3 billion dollars on radar equipment for her Armed Forces. She had to spend another 300 million dollars on counter and counter countermeasures to prevent the costly radar equipment from going to waste. In addition she spent 71 million dollars on the navigational aid, *Loran*. The amount spent on research and development in all aspects of radar alone was about 172 million dollars and over 5,000 scientists and technicians were employed on these tasks. The development and production of radar equipment of all types cost an enormous amount of money and require well-developed electronic and auxiliary industries and adequate scientific and engineering manpower.

Electronic equipment is fairly complicated and requires a high degree of skill in its operation and maintenance. Radar jamming makes the radar operator's or fighter controller's task most difficult if not impossible. The appearance of new type of jamming is likely to spread consternation among even experienced operators. The operators, therefore, have to be very highly trained and should be given constant practice in tracking target echoes through all known types of interference and jamming. The operator's skill, initiative, and ingenuity must be developed to a high degree to help him to overcome new problems of jamming and interference. The maintenance personnel require a high degree of technical knowledge. In order to get the best out of the equipment it may be necessary to attach scientists and highly skilled engineers to the frontline units. Due to modern miniaturization technique and precision manufacture of electronic equipment, well-equipped maintenance units and factory backing would be essential to support the operational units.

Conclusion

In World War II no other scientific development was so closely tied up with actual military operations as electronic countermeasures. Tactical successes in the electronic field were obtained by both sides for short periods only with the help of the inventive genius of their scientists and by enormous operational effort. This total effort was fully justified by the savings in bomber aircraft, valuable aircrews, and above all by the destruction of the enemy's war potential by accurate bombing.

Since World War II there has been considerable development in the radar field and application of radar for controlling guided missiles. New and more efficient electronic navigational and blind bombing aids have been devised. In a future war the fast jet bombers carrying atom bombs and the guided missiles with atomic warheads may be employed on a large scale to bring about the utter destruction of an enemy. Since both these weapons of mass destruction may mostly depend on electronic equipment for their deliverance, what could be a more powerful weapon than electronic countermeasure? Thus in a future war electronic countermeasures may well be a primary weapon of a country whose very survival may depend on its scientific genius and industrial potential to keep its electronic development well ahead of its enemies.

Soviet Naval Strategy

Translated and digested by the MILITARY REVIEW from an article by H. C. Uggla in "Ny Militär Tidskrift" (Sweden) No. 12, 1954.

A QUESTION of great political and military significance is the interpretation of the Soviet intentions relative to their growing seapower. The security of the western powers is regarded as contingent on whether they will be able in the future to continue to maintain their superiority on the seas. For in the event of war it is this capability that will enable them to maintain their vital sea communications and, at the outbreak of hostilities before the land forces of the western powers have been brought up to the required strength, to launch attacks on the enemy with carrier-based aviation. It is therefore natural that the growth of Soviet might on the seas should be followed with close attention—an attitude that was quite obvious on the occasion of a Soviet ship's visit to the West and also evidenced by the fact that funds are being asked for the upkeep and improvement of our own naval forces. One notes the statements of leading Soviet statesmen and attempts to determine the deeper intentions behind organizational measures and concrete construction programs. One also studies the Soviet Navy's actions in former wars and the doctrines which the leading theoreticians of the Soviet Union have sought to establish in this field. This differs in certain respects from the concept of the western nations concerning the strategy of naval warfare.

This results in a fairly definite confirmation of the belief that the Soviets in general have shown very little ability to hold their own against their adversaries in earlier naval actions in modern times. It suffices to mention the outcome of the Crimean War, the Russo-Japanese War, and World War I. The naval fighting of 1941-45 presents certain aspects which should be noted for the particular reason that it was conducted on the Russian side under the Soviet regime.

After every war Russia has attempted to rebuild her crippled seapower, knowing that during every regime it was sooner or later understood that realization of national aspirations made this necessary. This fact has been recognized by the Soviet regime also. After World War I and the revolutionary period, the Soviet Fleet for a long time ceased to be a factor to be considered. This among other things was evidenced at the Naval Conference in Rome in 1921 when the Soviet Union consented to reduce her fleet tonnage to 280,000 tons under certain conditions. Among these were conditions relating to the closing of the Black and Baltic Seas to "foreign" war vessels. This request for the barring of this interior sea to non-literal nations had its origin in the then existing lack of fully effective Soviet naval forces with the consequent difficulty of defending the Soviet coasts. Beginning with 1928, however, the Soviet Union began rearming her fleet almost from the ground up, a task which in spite of good progress she had not had time to complete at the outbreak of the war in 1941.

In the meantime an evolution in the Soviet naval policy had also begun. Up until 1936 the concept of a defensive fleet which could protect the coasts of the Soviet Union and her own waters had been the foundation for Soviet naval strategy and controlled the Soviet Fleet construction policy. Leading personalities now began speaking of the need for a more aggressive naval strategy based on the concept that the best defense was an offensively conducted one into the waters extending to the enemy's coasts. At the same time there was a weeding out of the leading officers of the fleet who were reported to have hindered its development into an effective offensive weapon. The dynamic Admiral Kuznetsov was retained as leader of the fleet which likewise had been given a more independent organizational status with respect to the Army. The naval war against Germany was fought under Admiral Kuznetsov's leadership. After a temporary reversion over a period of a few years following the war to a status of closer attachment to the Army under Admiral Yumasev's leadership, the Soviet Navy, now again under Admiral Kuznetsov's command, appears to be assuming an independent position with respect to the Army. This could indicate a resumption and continuation of the offensive attitude of 1936.

War Mission

During the war period of 1941-45 the Soviet Navy had neither the means nor geographic prerequisites for offensive naval warfare. Under the influence of the German superiority in land warfare during the first year of the war, the Soviet Navy's principal mission was to secure the Army's sea flanks against landing attempts by the adversary and naval bombardment from the sea. This mission was successfully fulfilled, but the reason for this was mainly that the Germans were only able to engage weaker naval forces and aviation in the war against the Soviet Union since their main naval forces were being used against the western powers. Because of their central position these main German naval forces were able to exert a silent pressure on the naval operations against the Soviet Union. Consequently, it was through lack of naval forces suitable for offensive operations that the Germans were unable to facilitate their advances overland by flanking operations from the sea. The Russians had always been very vulnerable to this form of attack.

The larger Soviet vessels were held back as a rule. This was caused largely by the fact that the advanced Soviet bases were lost to the Germans who seized them by land operations.

This dependent relationship of naval warfare to land warfare is the thing that

basically distinguishes the Soviets' and the western powers' concepts of naval warfare. Soviet naval writers particularly stress the influences which geography and other limitations have on the Soviet exploitation of seapower for the attainment of their aims. This is also the deeper reason behind the relative shift in the Soviet Union in the direction of submarine warfare and the defensive employment of surface vessels.

Although the larger Soviet war vessels were not engaged offensively during the last war against the German sea communications in the Baltic Sea, the Black Sea, and the Arctic Ocean, they were engaged and willingly sacrificed in the defense of Soviet naval bases such as Sevastopol. This occurred during the Crimean War when the major part of the Black Sea Fleet was sunk by the Russians at Sevastopol to block the entrance to the harbor, and the remainder was burned when the Russians withdrew from the fortifications at the end of the war.

Soviet submarines and aviation particularly were employed to combat the overseas transportation which was so vital to German land operations. A partial success was obtained by this means, but the effects appear proportionally to have been considerably lower than those which the Germans obtained against the western powers. Even during the German withdrawal with its considerable evacuations of personnel and matériel by sea, the result of Soviet attacks on this sea transportation was relatively minor.

One aspect of the naval operations between the Soviet Union and Germany which merits the greatest attention is that of Soviet landing operations which were carried out during the German retreat. These operations accelerated the retreat and immobilized German forces for coastal defense. Particularly in the Black Sea area where the German naval forces for natural reasons were unimportant, these Soviet amphibian operations, which were often carried out with the aid of improvised transportation means and under difficult external conditions such as during the winter, had a considerable effect on military developments.

The operations of the Soviet Fleet during World War II were summarized by the Soviet Admiral, Alafuzov, in the following manner—account not being taken of the degree of effectiveness which is evident from the preceding paragraphs:

The Soviets' naval forces defended our sea communications not only on the coasts of the Black Sea and the eastern Baltic, but also in the north, and ensured the maintenance of beleagured Odessa, Hangö, and Sevastopol. They secured the water communications over Lake Ladoga with besieged Leningrad, defended the eastern sector of our communications by way of Murmansk and Arkhangelsk with our Allies. They cut the enemy's sea communications in the southern Baltic and the western part of the Black Sea and the sealanes north of Scandinavia and his communications with the Crimea (where his land communications had previously been cut). They defended our territory against enemy invasion via the seas and repulsed the attempted landing by the enemy in Lyn Bay (Ösel), at Keigust (1941), and on Sukho (1942). By the disposition of our naval forces, landing attempts were prevented at other points on our coast. Attacks were executed from the sea on territories occupied by the enemy (Feodosiya, Kert, Novorossiysk) besides a large number of smaller operations in the Black and other seas. They defended installations in our own territory by their mere presence, as well as by combat, in a number of cases. . . .

Admiral of the Fleet (then Chief of the Naval Staff) Isakov likewise writes:

The chief and most important mission that has been fulfilled by our fleet in

Soviet waters has been to protect the Army's strategic flanks resting on the sea against enemy landing attempts and naval operations and to execute thrusts against the enemy's flanks and rear lines, and to prevent the enemy from executing attacks by way of the sea on our Army's flanks by subjecting him to devastating fire on his own flanks and on the Romanian coastal batteries with our destroyers and patrol and gun boats.

World War II presented the picture of a Soviet naval force which in the words of Stalin on Fleet Day, 22 July 1945, had been, "a loyal helper of the Army in the war against Germany." It had "effectively protected the Army's flanks resting on the sea, had sunk enemy merchant ships, and protected the Soviet communications." After he had pointed out that the fleet in this war had written:

New pages in the book of Russian heroic history, Stalin declared that, *the Soviet people will see their fleet still stronger and mightier. Our people will create new warships and new bases for their fleet. The fleet's mission is to indefatigably train and perfect its personnel, with the view to its fully profiting from the experiences it has gained in the war, and still more to increase the fleet's skill, discipline, and organizational capacity.*

Present Policy

In this speech Stalin called attention to the principal characteristics of the future Soviet naval policy. Today we are able to discern that in several respects this policy is now assuming concrete form.

Fundamental in the Soviet concept may still be said to be the Navy's responsibility toward the Army's flanks resting on the sea. This is the principal mission for the surface elements, the marine infantry, the naval aviation, and the coastbound submarines. This, however, doubtless comprises offensive missions along the lines of those assigned to the Army. Just as was the case during the last war, the Navy by means of tactical outflanking operations—of perhaps more limited radii each time—will seek to aid the land front and to compel the Soviet adversary to take extensive measures resulting in the splitting up of his forces for the protection of his coast. Strong amphibious forces for this purpose are included in the Navy which now possesses various types of invasion craft for use on interior waters and coastal oceanic waters. As yet there is nothing to indicate that the Soviet Union possesses the means necessary for the execution and protection of any major transportation operation over more extensive oceanic areas. This would require air protection by carrier-based aviation able to follow the transport vessels, and also more powerful ships than the crusiers which at present belong to the Soviet Fleet. It is a known fact that Admiral Kuznetsov served on cruisers for many years during his naval career which possibly may have influenced the shaping of the naval construction program.

The larger Soviet submarines, reasoning on the basis of their size and number, are certainly intended for use against the sea communications of the western powers and perhaps even in coastal raids with guided missiles and atom bombs, since this has now become technically possible. The war experiences of the Germans with respect to submarine warfare are available to the Soviet Union.

In addition to the submarines, naval aviation can also be employed in naval warfare within the limits of its flying radii, and air attacks will perhaps be conducted primarily against ports. In this connection the danger of sabotage operations against shipping and port installations should not be overlooked.

Panzer Divisions

Digested by the MILITARY REVIEW from an article by R. M. Ogorkiewicz in "The Army Quarterly" (Great Britain) April 1955.

CONSIDERING the important part which the German armored formations played in the campaigns of World War II, and the interest which they attracted, it might have been expected that all their more important characteristics would have been very thoroughly studied and understood by now. It was felt that among other things their organization and trends of evolution would be well known; however, strange as it may seem, this does not appear to be the case, and erroneous statements appear even now. For this reason, as well as the intrinsic historical interest of the subject, the development of German armored formations would justify a re-examination.

Officially, the development of German armored formations began in October 1935 —the date when the first three Panzer divisions were simultaneously called into being. This event was, however, preceded by smaller-scale experiments and an improvised Panzer division used in the summer maneuvers of that year, as well as developments elsewhere, notably in this country.

The influence of British ideas on the early German development was considerable, and it is not surprising, therefore, that the first Panzer division was built around a tank brigade, to which was added a motorized infantry brigade. The tank brigade had for several years been the largest standard tank unit, and by the midthirties became a generally accepted basis of armored formations. Its combination with a motorized infantry brigade had already also appeared—in this country [Great Britain] on a temporary basis during the 1934 maneuvers and on a permanent basis in the then newly organized French *Division Légère Mécanique*.

In principle then the reorganization of the first Panzer divisions did not depart from the lines of thought which were generally, if slowly, becoming accepted. Such differences as there were, were in detail and in the governing operational ideas.

The tank brigade of the original Panzer division consisted of two tank regiments, each with two battalions, with a nominal total of 16 tank companies, or 561 tanks. This represented a very powerful tank component, and without question reflected in part the influence of contemporary British thinking, with its emphasis on tank strength within the framework of mechanized formations, sometimes to the exclusion of everything else.

The last extreme of "all-tank" ideas was, however, never accepted by the leaders of the *Panzerwaffe*, and it was there probably that they diverged most rapidly from the prevalent British ideas. The latter for some time remained biased toward the "all-tank" concepts, whereas the Panzer division became rapidly and increasingly a versatile combined arms' team and a versatile fighting formation, instead of being merely a mobile formation for exploitation. Thus from the start the Panzer division had its infantry brigade, consisting of a 2-battalion motorized infantry regiment and a motorcycle rifle battalion, an artillery regiment with twenty-four 105-mm howitzers, an antitank battalion, and an engineer company. There was also a reconnaissance battalion of motorcyclists and armored cars as well as all the usual divisional service units.

Changes Prior to 1940

Judging by published evidence the Order of Battle of the original Panzer division was known fairly accurately. What appears to have been less well known are the subsequent developments and the

changes which took place even before any major battlefield experience.

The first major change was an increase in the infantry strength and a simultaneous reduction in the number of tanks. The former increased the number of rifle battalions per division to four, either by an expansion of the motorized infantry regiment by one battalion or by having an infantry brigade with two 2-battalion regiments. The latter was partly the result of mobilization, when tank battalions were reorganized into one medium and two light tank companies, and the fourth company of each battalion was redesignated as a depot and replacement unit. It was also due to the arrival of more powerful tanks, the light-medium *Pz. Kpfw. III* and the heavy-medium *Pz. Kpfw. IV*, in place of the original 2-man *Pz. Kpfw. I* light tank. As a result each division now had about 320 tanks, and the proportion of tanks to infantry became 12 tank companies to 12 rifle companies, in place of the original ratio of 16 to 9.

The engineer company was also expanded into a battalion; and one division, the 2d, received an additional medium artillery battalion. Other divisions had to rely on attached medium as well as antiaircraft artillery.

The changes took place mostly before the war and the above modified organization held good for 6 out of the 10 Panzer divisions which took part in the 1940 French Campaign. In spite of changes the organization of these divisions was still basically that of the original or "Guderian" division as it has sometimes been called after the man most responsible for its creation. The other four divisions, however, differed considerably and what is more owed little of their origin to the original Panzer divisions.

While the Panzer divisions were being created in the midthirties under the aegis of the Inspectorate of Motorized Troops, the cavalry of the German Army was also setting about the problems of motorization. It was not the first, for the cavalry of the French and Italian Armies was already partly motorizing their *Division de Cavalerie* and *Divisione Celere*, and the French cavalry already had its first *Division Légère Mécanique*. However in 1937 the Germans formed the 1st Light Brigade as a fully motorized formation intended for the classic cavalry role of strategic reconnaissance and security. A year later the brigade was expanded into a division and three more such divisions were simultaneously created.

In essence the Light division was a motorized infantry formation with a motorized rifle brigade of two 2-battalion rifle regiments and a tank battalion with about 90 *Pz. Kpfw. II* light tanks. Originally there was a reconnaissance regiment with one battalion of armored cars and one of motorcyclists, but this was later reduced to one mixed battalion as in the Panzer divisions; other units of the division were also similar to those of the latter. The chief characteristic of the Light division was its strategic mobility; for instance there were organic tank transporters for all of its tanks, and in keeping with its defensive, screening role its rifle companies possessed twice the normal allocation of machineguns.

In 1938 on the formation of the Inspectorate of Mobile Troops under Guderian, the Light divisions passed from the control of the cavalry and together with the Panzer divisions came under the new Inspectorate. They retained their identity, however, until after the 1939 Polish Campaign, when they were reorganized into Panzer divisions, the 1st, 2d, 3d, and 4th Light Divisions becoming the 6th, 7th, 8th, and 9th Panzer Divisions.

The reorganization was mainly confined to increasing the tank strength from the single battalion to a regiment, with three battalions in the case of three divisions and two in the case of the other, the 9th

Division. The reorganization was hampered by shortage of equipment, and the Light divisions were equipped for the most part with Czechoslovakian built tanks; there was also a considerable number of the inadequate *Pz. Kpfw. I* still in use.

Altogether on the eve of the 1940 French Campaign, there were 35 tank battalions in the 10 Panzer divisions, representing a total of about 2,600 tanks—less than the number of French tanks alone.

1940 Reorganization

After the French Campaign which firmly established the Panzer divisions as the decisive element in land warfare, a further reorganization and expansion of the armored forces took place. The number of Panzer divisions was doubled at the expense of the number of tank units per division. At the same time the strength of the infantry in each division was increased still further, partly to make up for the reduction in the number of tank units and partly to satisfy the usual demands for more of it. The actual date of the reorganization order was 10 September 1940, and it anteceded, therefore, by about 2 years similar reductions in the numbers of tanks and increases in the infantry strength of British and American armored divisions. It did not as has sometimes been claimed follow them.

The new organization was put into effect before the campaigns of 1941, and with it the Panzer divisions bore a stronger resemblance to the converted Light divisions than to their own original form. Thus the new "1941" division had only a single tank regiment with two or three battalions, but an infantry brigade with two 2-battalion infantry regiments and a motorcycle rifle battalion. The artillery was strengthened by the addition of an organic medium battalion and of an antiaircraft battalion with 88-mm guns, and minor changes took place in the composition of other units.

The infantry in all the divisions was now equipped along the lines of the former Light divisions, each rifle company having no less than 20 belt-fed machineguns. In addition to three rifle companies, each battalion had one machinegun company and one heavy company of antitank and infantry guns, and each regiment had one company of 150-mm heavy infantry howitzers. Tank battalions were each organized into two light companies with *Pz. Kpfw. III*, and one medium company with *Pz. Kpfw. IV*—frequently and incorrectly referred to as "close-support" tanks.

Including the light *Pz. Kpfw. II* tanks still used for reconnaissance, there were about 70 tanks per battalion, six divisions having three tank battalions and the remaining 14, two each. The total was thus 46 tank battalions, and it was with this force that the Germans came close to defeating the Soviet Army.

Campaigns of 1941-42

The Soviet Campaigns took a heavy toll of the Panzer formations and affected seriously their effective strength which began to be governed by losses and availability of replacements as much as by their war establishments.

Thus in preparation for the summer offensive of 1942, Panzer divisions in the southern sector of the Eastern Front, where the main German effort was concentrated, were re-equipped with three tank battalions each. Those in the central and northern sectors received practically no replacements, and as a rule had only one, sometimes two, weak tank battalions.

During 1942 several other changes gradually emerged. The infantry strength was reduced somewhat with the disappearance of the motorcycle battalions—partly by their amalgamation with the reconnaissance battalions. The infantry brigade headquarters also disappeared, like the superfluous tank brigade headquarters had done 2 years earlier, and the two rifle regiments were placed directly under divi-

sional control, the same as the tank regiment. The designation of infantry, or rifle, regiments was changed about the same time from that of *Schutzen* to *Panzergrenadier*, and one of the four battalions in each division was from then on actually equipped with three-quarter track armored personnel carriers.

The reduction in the strength of the infantry by one battalion was accompanied by a small nominal increase in the strength of the tank battalions, from three to the original prewar figure of four tank companies; except in the case of the heavy *Tiger* battalions, which were then beginning to be formed. In practice the tank strength varied considerably from the nominal figure of 22 tanks per company to 14, or even only 10 in the case of the *Tiger* battalions. Similarly the number of tank companies per battalion varied, the increase to four not being immediate nor always maintained.

In the case of the two Panzer divisions in Africa, for instance, the fourth tank companies arrived around May 1942. These divisions represented something of a special case, however, both on account of the long and vulnerable lines of communication and the freedom left to the commander on the spot regarding the details of the organization.

Originally the troops sent to Libya in February 1941 consisted of one tank regiment with two battalions, one artillery regiment, three machinegun battalions, and one battalion each of antitank guns and engineers. This was clearly a group put together to suit the existing conditions; it was subsequently named the 5th Light Division, although the first four light divisions had already ceased to exist as such. Still later it was expanded to the strength of a Panzer division and renamed the 21st. The second Panzer division, the 15th, which arrived later had more or less a normal organization with two tank and four rifle battalions. Changes in the composition of the two divisions were, however, frequently made on the spot, so frequently in fact that in the end neither the *OKH* nor the command in Africa could keep pace with the changes.

1943 and 1944 Divisions

Following the heavy losses of yet another winter campaign and the return of Guderian to the scene as Inspector General of Armored Troops early in 1943, another reorganization was contemplated. The losses in the Stalingrad operations were staggering—in February 1943 amounting to no less than 1,596 tanks, higher than during any other corresponding period during the war. Tank production was, however, rising from the totally unrealistic level of the early war years, and in 1943 was almost double that of 1941. In addition to tanks the production of the tank-like, but turretless, *Sturmgeschutz* and *Jagdpanzer* was considerably increased—sixfold between 1941 and 1943, actually overtaking that of tanks by the end of the war.

Partly on the strength of the rising production figures and partly due to Guderian's firm conviction of the need to strengthen the tank core of the Panzer divisions, the main change which was contemplated was an expansion of the tank regiments to four battalions. One of these regiments was to be temporarily equipped with assault guns which on the Soviet plains were as good as turreted vehicles. Another was to be equipped with *Tiger* heavy-tanks—which incidentally shows that these were not, contrary to some statements, regarded as "infantry tanks." The inclusion of *Tigers* also shows once more that the Panzer divisions were not intended solely "for exploitation after the enemy's position has been broken," but that they were regarded as versatile fighting formations combining maximum striking power with mobility.

In addition to tanks a much more generous allocation of armored personnel car-

riers was also contemplated, as was that of self-propelled carriages for the divisional artillery, the first few self-propelled 105- and 150-mm howitzers having appeared toward the end of 1942.

However in spite of the rising production figures few of the contemplated changes were put into effect. As a rule, from 1943 on Panzer divisions had no more than two tank battalions, four rifle battalions—only one of which was equipped with armored carriers—and self-propelled carriages for only one artillery battalion. In the summer of 1944 this was recognized as the official establishment, and it may be taken as the "average" composition of Army Panzer divisions during the latter part of the war.

Panzer Grenadier Divisions

There were of course exceptions to the rule. A few divisions, like the 10th Panzer in 1943 for instance, had three tank battalions including a *Tiger* battalion. In the spring of 1944 the "elite" *Grossdeutschland* division even had four, also including one *Tiger* battalion. This division and the *Panzer Lehr* also had a higher allocation of armored carriers; in fact on the eve of the Allied landings in Normandy the *Panzer Lehr* had all four of its Panzer Grenadier battalions in armored carriers, as well as its engineer battalion, and all of its artillery was self-propelled. Even this favored division only had two tank battalions, one of *Panthers* and one of *Pz. Kpfw. IV*, with a total of about 190 tanks. Other divisions were similarly equipped with one *Panther* and one *Pz. Kpfw. IV* battalions, but their total strength was seldom more than 170 tanks, usually far less. In regard to the turretless assault guns and *Jagdpanzer*, in most cases one mixed battalion of them, and towed guns, replaced the earlier all-towed antitank battalions.

Another exception to the rule was the Panzer divisions formed by the conversion of Panzer Grenadier divisions. *Grossdeutschland* was one and the *Waffen-SS* Panzer divisions were the others; at their peak in 1944 there were eight *SS* Panzer divisions against 25 Army ones.

Panzer Grenadier divisions had their beginning as motorized infantry divisions, and just as the Light divisions represented the contribution of the cavalry to the development of motorization and mechanization, they represented the contribution of the infantry.

The original, prewar motorized infantry division was a conventional, 3-infantry-regiment—or 9-rifle-battalion—formation which had simply exchanged its horse traction for motor transport. After the 1939 Polish Campaign its organization was adjudged too heavy for its followup role, and one of its infantry regiments was replaced by a motorcycle rifle battalion. In this form the divisions took part in the French and early Soviet Campaigns. By 1942, like the Panzer divisions, they lost their motorcycle battalions, but in that year the divisions on the southern sector of the Eastern Front—not elsewhere—received for the first time one tank battalion each.

In the following year this was extended to all divisions, although some received an assault-gun battalion in lieu of the tank battalion. In June 1943 they were officially renamed Panzer Grenadier divisions, the Panzer Grenadier designation having also already been applied to the infantry of the Panzer divisions. About the same time the control of their regiments passed from the infantry to the Inspectorate of Armored Troops—which did not prevent Guderian from deploring the diversion of tank strength from the Panzer divisions proper to the Panzer Grenadier divisions.

A further diversion occurred later in the same year on the formation of the first *SS* Panzer divisions. Up until then the *Waffen-SS* had contented themselves with motorized infantry formations, but

in October 1943 the first *SS* Panzer divisions were created by the transformation of some of the existing *SS* Panzer Grenadier divisions. In principle the only major difference between these formations and Army Panzer divisions was the fact that their Panzer Grenadier regiments had three instead of two rifle battalions. In practice the *SS* divisions were considerably better off in regard to their equipment and replacements because of the political pressure which they could and did exercise, and their strength was maintained much better than that of the Army formations.

Trends

The existence of these formations with six rifle battalions each, and the fact that on the Eastern Front Army Panzer divisions often had only one tank battalion and were thus no better off in this respect than Panzer Grenadier divisions, resulted in demands for 3-battalion infantry regiments for the Panzer divisions also. Much of this demand must, however, be attributed to the shortage of tanks. Generally the four Panzer Grenadier battalions per division were considered adequate, and the Panzer commanders who looked beyond the more immediate needs and problems emphasized the importance of increasing the tank strength of the divisions and not their infantry. Their aim throughout was to expand the Panzer regiment to four tank battalions.

The tank strength of the Panzer divisions during the latter part of the war was plainly inadequate. Not only were there no more than 8 tank companies to 12 rifle companies but the nominal strength —let alone actual strength—of the companies was reduced from 22 to 17 tanks, then to 14, and finally to 11.

The inadequate tank strength was a severe handicap and placed an additional—and in an armored formation an unjustified —load on the infantry units. One of the results was that the Panzer Grenadier was burdened with all types of supporting weapons which could have been dispensed with to advantage by closer integration with an adequate tank force. Other shortages, notably those of armored carriers and self-propelled guns, hampered no less the development of balanced, fully integrated formations.

For instance, with a major portion of the infantry carried in unprotected wheeled vehicles the formation of closely knit tank-infantry teams was difficult, even when tanks were available. German Panzer divisions could not, therefore, develop fully their system of mixed battle groups, or *Kampfgruppe*, which they introduced and in spite of difficulties used with very considerable success. Like all other systems it was, of course, open to abuse. It has been criticized by German commanders and others, even to the extent of being described as a sign of incompetence on the part of divisional commanders. The most common argument against it has been that splitting up the division into permanent battle groups was a deliberate surrender of responsibility by the divisional commander, and that keeping tank and infantry battalions separate under their respective commanders was a far superior method.

However, the essence of a successful *Kampfgruppe* system was its flexibility and the formation by the divisional commander of tactical teams to meet the needs of the situation. The grouping of tanks under one command and of all the infantry under another had its advantages on occasions in setpiece actions and even more so when tanks were very scarce. It was also dictated at times by the very different cross-country capabilities of tank and infantry units, the latter lacking sufficient numbers of armored cross-country carriers. It also had numerous disadvantages, the chief being that tanks and infantry each tended to get involved in private

battles of their own and could not properly complement each other, and in practice the system of mixed battle groups proved superior.

Properly applied the system of mixed battle groups enhanced the mobility of Panzer formations and gave them an advantage over the more rigid and therefore slower systems of their adversaries. It was also more suited to the conditions of the modern battlefield than the employment of an entire division in one body, particularly in the face of enemy air superiority—and it would be even more so against tactical atomic weapons.

The Germans never carried the *Kampfgruppe* system to its conclusion to the extent of basing their divisional organization on it. This was left to the American armored divisions with their system of flexible combat commands, self-contained battalions, and a much higher degree of mechanization than that ever attained by German armored divisions. By introducing it and by championing the principle of armored divisions as versatile mixed arms fighting formations—and not merely as formations for exploitation—they made a notable contribution to the development of modern land forces.

The Development of Area Defense in Jungle Warfare

Digested by the MILITARY REVIEW from an article by Major General H. L. Davies in the "Journal of the Royal United Service Institution" (Great Britain) February 1955.

CONSIDERABLE thought had already been given to area defense in the Middle East theaters before Japan entered the war. The theory of defended areas, tank-proofed and self-sufficient, with mobile striking forces operating behind and between the areas, was already *de rigeur* in the Western Desert and the highly successful detachment at Tobruk, with its manifest influence on the northern flank of the Axis armies, was widely recognized.

A study of the technique of area defense was undertaken at the Higher War School in New Delhi in the autumn of 1941, and it was fully appreciated that during the defensive phase of any campaign, when the initiative lies with the enemy, this technique possesses very great potentialities. Unfortunately, as so often happens, false lessons were occasionally drawn from an incomplete understanding of the requisites for successful area defense, and I recollect coming across a battalion, positioned to deny the main approaches into east Burma through the Shan States, which had dug itself in on the Thai border and whose commander informed me that he intended to make a "Tobruk" of his position and to remain "put" under any circumstances. The fact that no mobile counteroffensive reserves existed within 50 miles of his position, and that once his exiguous road communications were cut there would be no method of supplying his troops, had apparently not occurred to him. It might appear that even to this day such elementary errors can be made if we are to assess the tragedy of Dien Bien Phu in terms of successful area defense. The ideas of that battalion commander in Burma in 1941, and of the commander who evolved the tactical conception of Dien Bien Phu, seem to have had much in common.

When the Japanese invaded Malaya in December 1941 our troops in that theater were very dispersed. Brigade groups were located at various places on the long eastern coastline where attempts to land might be expected, and reliance was placed on normal overland communications leading north from Singapore.

As things turned out the command of both air and sea passed very early to

the enemy, and the vigorous and traditional tactics of the Japanese, which implied continual infiltration, bypassing, and outflanking movements, rapidly led to the necessity for hurried and uncoordinated withdrawals. These not only rendered futile any coherent defensive plan with the employment of properly constituted mobile reserves, but also greatly impaired the morale of the troops. Much has been written about the inability of our troops in Malaya to withstand the Japanese offensive, but under the circumstances in which they were placed, without command of either the air or the sea and dependent entirely on extended and easily cut road communications, there was only one possible conclusion to this campaign and it really would have made no difference at all if every man had died fighting where he stood, as a great many of them in fact did. It was the conception that was wrong, not the troops' fighting capacity. The only possible method of saving the base at Singapore would have been to re-establish command of the sea and to organize a tightly knit area defense in a bridgehead covering Singapore with all available resources, including a high proportion of properly organized mobile counterattack troops. Even then, to be reasonably effective, it would have been necessary to have deployed an adequate air force on dispersed airfields within the defended bridgehead. As these desiderata were quite impossible under the circumstances, the fall of Singapore became inevitable.

A very similar sequence of events took place when the Japanese invaded Burma in February 1942. The same enforced withdrawals, with their inevitable effect on the morale of the troops, occurred in the absence of adequate mobile reserves to counter the Japanese tactics of infiltration and outflankment.

In this campaign, however, one major mistake was corrected, and instead of recoiling on to the untenable base of Rangoon, the retreating army moved northward toward the Indian frontier, thereby retaining its freedom of maneuver.

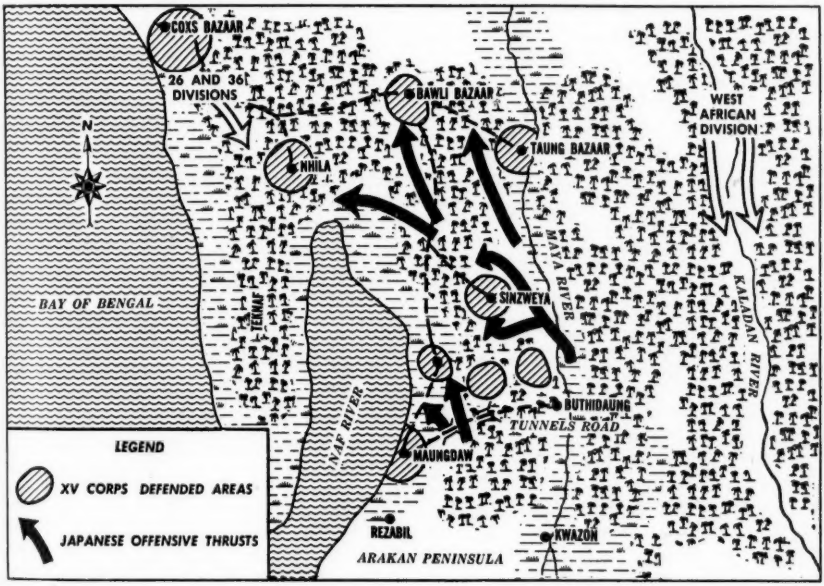
It is probably true to say of these two campaigns that in the absence of either sea or air command and with the extremely limited resources at the disposal of the commanders concerned, no system of defense could have stemmed the Japanese offensives. The traditional tactics of the enemy, nevertheless, had been very clearly brought out and intensive study of the right methods of countering these tactics was initiated in India. A further impetus was given to this study by the success of air supply in maintaining the first Wingate operation in north Burma during 1942. Very gradually the command of the air was being wrested from the Japanese in the Burma Theater, and this decisive factor, together with the arrival of considerable numbers of *Dakota* transport aircraft, began to make possible the development of air supply as an alternative to road communications.

Training Exercises

During 1943 a series of large-scale interdivisional exercises were held in south India under the guidance of General Sir Phillip Christison, in the course of which the interrelationship of area warfare and air supply was studied. In particular the all-around defense of administrative areas was considered and it became a principle that divisional and brigade administrative areas, or "boxes," should be given a proportion of defense troops, including antiair, antitank, and infantry resources, and that their defense arrangements should be properly coordinated by a selected commander and staff.

As it happened it was the XV Indian Corps in the Arakan, commanded by General Sir Phillip Christison, which first put into telling effect this technique of self-supporting defended areas maintained in emergency by air supply. In the spring of 1944 the XV Corps was thrusting south-

ward in the Arakan with its immediate objective the general line Maungdaw-Tunnels-Buthidaung. The Japanese were holding on firmly in the Rezabil fortress and the Tunnels and, pivoting on these very strong positions, they launched a traditional counteroffensive (see sketch map below), hooking in from the east against the flank and rear of the 7th Division, put up an extremely stout resistance and all efforts by the Japanese to overrun the area were successfully resisted. In the meantime the situation having become apparent, the Corps Commander ordered all troops to stand fast in their defended areas, cleared his road communications of all traffic, and began to maintain the corps, including the 7th In-



dian Division. Their plan was to capture Taung Bazaar, seize the Ngakyedauk Pass, which ran through the spine of the Arakan Peninsula and by which the 7th Indian Division was supplied from the corps base, drive across the high ground to the coast, and cut the road communications of the forward divisions. In fact the Japanese columns moving in from the east ran up against the 7th Indian Division administrative box at Sinzweya on the eastern side of the Ngakyedauk Pass.

The troops in this defended area personally commanded by General Messervy, Commanding General of the 7th Indian Division administrative box at Sinzweya, by air supply entirely.

Two reserve divisions, the 36th and 26th, were hurriedly moved forward from rest areas behind Chittagong with instructions to destroy the Japanese forces which had infiltrated. For the first time since the war started the Japanese found themselves "up a gum tree." They had assumed that as soon as the British communications were threatened, there would be the usual hurried withdrawal, with the abandonment of dumps and supplies on which they would maintain themselves during the pursuit of their enemies. Instead they found them-

selves surging about the unoccupied zones between and behind the British defended areas, unable to supply their own forward troops and with no administrative plan to remedy the situation.

Desperately they continued their all-out assaults against the 7th Indian Division administrative box at Sinzweya but gained nothing except a bloody nose. Meanwhile the inexorable advance of the 36th and 26th Divisions began to exercise a heavy and unbearable pressure. True to their methods the uncoordinated Japanese units fought in their dug-in positions to the last man and last round, but starving, short of ammunition, and unsupported they eventually broke, and the remnants of their counteroffensive troops withdrew behind their original frontline.

This battle definitely broke the Japanese in the Arakan. They were never again an offensive force and within a year were to be hurled out of the Arakan and out of Akyab which had been their base in this theater since 1942.

The great Japanese offensive against the IV Corps of the Fourteenth Army in the summer of 1944 followed immediately after the Arakan Battle. In fact it was the second phase of the Japanese plan to invade India.

Relying entirely on those principles of war which had given him such success during the period in which he had possessed the initiative—the principles of offensive action and surprise, allied to the high morale of his troops—the Japanese again neglected almost completely the principles of balanced administration and security. They aimed to capture the IV Corps base at Imphal and to maintain the impetus of their offensive by means of the dumps and stores captured from the British.

Their tactical plan was almost identical with that of their Arakan offensive. It comprised the same right hooks intended to sever road communications between Imphal and the railhead at Dimapur, together with massive infiltrations between the IV Corps defended areas.

Having pulled back the 17th Division which was dangerously isolated in advance of the corps right flank, General Slim settled down to fight a dogged defensive battle based on the various divisional area defense dispositions, meanwhile bringing forward both supplies and reinforcements by air. As the battle progressed and the monsoon approached, the Japanese found themselves in a progressively deteriorating situation. In the absence of a proper plan for the administration of their army, failure to break the British resistance and capture the Imphal base could mean only complete disaster to the Japanese.

However, the combination of proper area defense and air supply, together with the carefully planned hammer blows of the massive reserves gradually becoming available, decided the issue, and it was a starving and disease-ridden remnant of the Imperial Japanese Army that eventually made its way back over the Chindwin River after the monsoon broke.

Conclusion

Area defense in jungle warfare, as in the open theaters of the Middle East, had proved the effective answer. It could not have succeeded, however, without local command of the air which made air supply a possible alternative to land communications. Maybe the greatest contribution to final victory in Burma made by Wingate's Chindit expeditions was the lesson demonstrating that air supply can replace road and rail communications during prolonged periods of emergency.

There are surely pointers to the future in these campaigns and in the lessons learned with so much blood and sweat and tribulation during the period 1941-45.

With the atom and hydrogen bomb threat, a much greater degree of dispersion, both of the fighting troops and of their base areas, becomes essential. This

means more vulnerable communications, easily cut by infiltration or even by airborne troops.

The stability of any defense system based on a series of intersupporting areas and the availability of powerful counter-offensive forces must hinge on air supply. This in its turn is dependent on the availability of large numbers of the right type of aircraft and their ability to operate. They can only do so if local command of the air at least is assured.

Atomic Warfare and the Infantry Division

Digested by the MILITARY REVIEW from an article by Major M. R. W. Burrows in "The Journal of the Royal Artillery" (Great Britain) April 1955.

THE employment of an infantry division in an atomic battle has been studied during a number of exercises recently. However, many officers have been left with an uncomfortable feeling that "solutions" put forward to the various problems have been most inadequate. The basic reason for this dissatisfaction is that the infantry division was not designed for the type of warfare envisaged.

During the last 50 years, the division has been continually modified to take account of machineguns, motor transport, tanks, and other innovations. It is time that the organization was thoroughly overhauled and rebuilt to meet tactical requirements in the most likely theater of war.

Therefore, the aim of this article is to discuss the organization and equipment of a standard division for employment on the northern plains of Europe, or desert country, during the next 10 years.

It is proposed, first, to consider the tactics which might be employed in an atomic battle and, second, to discuss the shortcomings of the present infantry division. An outline organization for a new light division will then be set out, with some remarks upon its equipment. Finally, the implications of such a reorganization will be discussed before conclusions are drawn.

Particular attention will be paid to the problems of defense because this is likely to be the primary task of the British Army at the beginning of a war.

The Atomic Battle

It is proposed to make some general assumptions about the effect of tactical atomic missiles, and then to discuss the problems of the attack, and the conduct of the defense in an atomic battle. It is thought that the tactical problems of an advance or a withdrawal will not be greatly affected by atomic missiles, because comparatively small numbers of troops will be involved in the forward areas and they will seldom concentrate in sufficient numbers to warrant atomic attack.

It is improbable that a missile larger than the 20-kiloton bomb will be used on the battlefield because suitable targets for a larger missile rarely will occur.

It is assumed that a 20-kiloton missile will neutralize any unit within 3,000 yards of ground zero, except troops in armored vehicles dug-in with overhead cover, which will be neutralized if located within 1,000 yards of ground zero. It is also assumed that a corps commander will be allotted at least six atomic missiles for a major battle.

The word "atomized" will be used to describe the state of troops or an area "neutralized by an atomic explosion."

The Attack

It is unlikely that large-scale conventional infantry attacks will be launched, because, if an enemy commander received warning of the attack, he could withdraw his forward troops and explode his missiles over the attacking force. Three

atomic explosions would cause grievous casualties to the advancing infantry, the reserves, and crowded artillery gun areas of an infantry division deployed for a conventional attack.

The attacker would also lose some of the value of his atomic missiles, if he followed them up with an infantry attack, because an atom bomb could not be exploded within 3,000 yards of assaulting infantry, which could not then reach the affected area for about 45 minutes.

Therefore, it is probable that the commander of an attacking force will try to "atomize" enemy concentrations and then advance rapidly with tank or mechanized divisions. In this type of attack, he would be faced with three main problems, namely, the location of enemy concentrations, the passage of obstacles, and the positioning and movement of his reserves.

The location of concentrations of enemy infantry should be relatively easy, because they must be dug-in on tactical features covering the approaches to vital ground. There is no way of disguising the tactical importance of a piece of ground and, given a limited area to search, air photography should quickly reveal which features the enemy has chosen to defend. Concentrations of tanks will be more difficult to locate and to destroy because they can be dispersed over a wide area until they are committed to battle.

An obstacle belt must be penetrated quickly or the effect of any atomic explosions may have been countered by the movement of enemy armor. A large assault force on a narrow front would be most vulnerable to atomic attack by the enemy, so the obstacle should be breached at a number of points sufficiently far apart to avoid "atomization" by one or two missiles. The assault parties should either be carried in armored vehicles, which give them some protection against atomic attack, or consist of parties of infantry too small to warrant "atomization." The use of infantry assault parties will be hazardous, because the area of a successful breach is a likely atomic target for the enemy and it will be difficult to either dig-in the assault infantry sufficiently, or move them out of the area, before the attack comes. Armored breaching teams would be less vulnerable than infantry to atomic attack and could advance more quickly beyond the danger area around the breaches.

Reserve units must be located near enough to exploit any success achieved by the assault forces, but they must also be kept dispersed until required to avoid "atomization." Passing follow-up forces through a minefield will be a most dangerous operation, because the enemy will be expecting them, and will be ready to attack any congestion with atomic missiles. Therefore, reserves must be sufficiently mobile to be able to concentrate quickly when required, and to pass through any one of a number of widely separated breaches. They should also be carried in armored vehicles to give the troops some protection against heat, blast, and radiation when on the move.

Defense

It is proposed to consider the conduct of the defense primarily from the point of view of the division.

The aim of a division in defense must be to kill any enemy penetrating into its sector. This will be achieved most economically if the enemy can be forced to concentrate in sufficient strength to warrant atomic attack. The problem will be to make the enemy concentrate without committing large numbers of defending troops who might be "atomized."

There are three occasions when an attacking force may have to concentrate, namely, when launching a break-in attack, when crossing an obstacle belt, and when attacking ground covering the axis of advance. A division should, therefore, be deployed to bring about each of these

situations in turn. It follows that the division should be deployed in three groups, a covering force, a counterpenetration force, and a "pivot" force. It is proposed to consider the composition of each of these forces in turn, bearing in mind that a major assault will probably be launched by mechanized forces.

The Covering Force

The enemy will not launch a major attack if he is able to make progress with local attacks or by infiltration. Therefore, the covering force must be able to drive off local attacks—in regimental strength —and deal with infiltration parties.

It will be unwise to use large numbers of infantry in the covering force, because any concentration of troops in close contact with the enemy could be quickly located, and would then be in danger of "atomization." Therefore, the covering force should consist of the minimum number of well-equipped troops, supported by the maximum amount of fire.

Comparatively few men can hold a wide front if they are deployed on good tactical ground behind an effective obstacle belt. A river will seldom be a satisfactory line to defend, because it is usually difficult to cover with fire and observation. Therefore, the main obstacle should generally consist of a broad antitank and antipersonnel minefield, placed in front of a chosen line of defense. If this is to be quickly laid, large numbers of engineers, mines, and improved minelaying equipment must be readily available.

By day, the aim should be to cover the obstacle with the fire of machineguns, artillery, and tanks. Only such riflemen as are required to protect the tanks from surprise and to cover close country should be deployed, so that most of the infantry can be rested for night fighting. The tanks in the covering force are not primarily required for tank versus tank fighting; they need a gun and machineguns for use against infantry and they should be able to destroy armored minefield breaching vehicles at comparatively short ranges.

By night, the minefield must be covered by infantry patrols supported by artillery, machinegun, and tank fire. The tanks should be fitted with either infrared or CDL—a flickering searchlight, which blinds the enemy, but enables the tank crew to aim its guns at night—night fighting equipment to increase their effectiveness.

The troops actually covering the obstacle should be closely supported by groups of motorized infantry and light tanks, which should be available to counterattack enemy penetrating the minefield and to destroy infiltration parties. These groups would also need the assistance of movement light, infrared, or CDL equipment to enable them to move quickly and fight effectively at night.

In the face of a major attack, the covering force must be able to withdraw in contact with the enemy, delaying his advance and reporting his movements. Therefore, all infantry must have armored vehicles available for use in a mobile battle.

Counterpenetration Force

If the enemy launches an offensive, some forces are likely to penetrate the obstacle in sufficient strength to establish bridgeheads, but they are not likely to be strong enough to constitute a serious menace until they have been reinforced. Therefore, the defense should be content to contain the bridgeheads, while doing everything possible to hinder the movement of the enemy's reserves, with the object of creating worthwhile atomic targets on the enemy side of the obstacle. Thus, a divisional counterpenetration force will be required to halt the enemy's advance, to contain enemy bridgeheads, and to keep the breaches under fire.

This force must consist primarily of heavy and medium gun tanks, which can block an advance by enemy armor and bring effective long-range antitank fire to bear on vehicles moving in the breaches.

The tanks will require motorized infantry to work closely with them, because the effectiveness of the counterpenetration force will depend largely upon its speed into action and there will be no time to wait for infantry moving on foot, or in unarmored vehicles.

Assault engineers will also be required with both minelaying equipment and flails. The minelaying equipment will be needed to seal off a breach, to block an enemy line of advance, or to contain a bridgehead. It must be able to lay mines quickly under artillery and small arms fire. Flails will be needed to clear paths through our own minefields, which may be extensive, so that the mobility of the counterpenetration force is not unduly restricted.

The counterpenetration force should be supported by medium artillery to disperse enemy armored concentrations and to prevent vehicle movement through the breaches. Mobile radar stations will be needed to observe movement and to direct artillery fire at night and through smoke and dust.

The "Pivot" Force

Ground is nearly always the dominating factor in any military situation, and a force which allows the enemy to seize the best tactical ground will generally be defeated. It is unsound to rely upon fire to make a position untenable to the enemy, so vital ground must be defended by infantry. The difficulty is that the enemy will almost certainly "atomize" the ground covering his axis of advance.

Therefore, positions must be prepared, complete with minefields, on the ground covering likely approaches. However, the bulk of the defensive forces must be held in harbor areas, from which they can quickly reoccupy their positions, when the enemy has advanced to within the danger zone of an atomic missile burst over the position.

Infantry on foot would not be able to carry out this task, but a force of tanks and motorized infantry, moving along prepared and reconnoitered routes, should be able to occupy a position more quickly than the enemy could fight his way through the covering force and a defensive minefield. A mechanized "pivot" force could be harbored so that it could occupy alternative positions, depending upon the axis chosen by the enemy.

Summary

Large numbers of infantry are not likely to be used in a setpiece attack because infantry in the open and its supporting artillery will be most vulnerable to "atomization."

Infantry will be used primarily for infiltration, patrolling, and local attacks.

Setpiece attacks are likely to be launched across a broad front by mechanized troops, carried in vehicles which give protection against atomic attack.

Concentrations of infantry in the forward areas or dug-in on important tactical ground will be comparatively easy to locate and, therefore, vulnerable to atomic attack.

A division in defense should be organized into three groups, namely: a covering force, of motorized infantry and light tanks deployed along an obstacle; a counterpenetration force of armor and motorized infantry; and a mobile "pivot" force located so that it can quickly occupy ground covering enemy axes of advance.

It has been shown that a division in the future will need motorized infantry and more armor than is at present available in an infantry division. These requirements could be met by simply adding extra equipment and units to the present organization, but the infantry division is already too large and cumbersome. It has over 3,000 vehicles, but it has insufficient tanks to carry out an advance or withdrawal in open country, and no mobile troops for reconnaissance or to cover gaps between widely spread defensive areas.

It is, therefore, proposed to examine the components of the present infantry division in turn and show how economies and increased efficiency could be obtained by reorganization. This will provide a sound basis upon which to build a new formation for employment in an atomic war.

The infantry battalion is the basic element of the division. No other troops can do the work of the rifle companies, and none have such an exacting task. Riflemen are the most precious commodity in the Army because once they are exhausted a formation is ineffective. They should be better trained and of higher morale than any other troops.

However, today, some of the best men in infantry battalions are taken for the support company where they are employed on tasks which could as well be done by other arms. The result is that in many battalions the standard of patrolling and fieldcraft is low. Moreover, deployment is much delayed by the time spent in giving out orders to platoon commanders of the support company and coordinating their tasks with other arms.

In battle, rifle companies are left for long periods in exposed positions where they suffer severely from enemy action and from mental and physical strain. A "wastage" of precious riflemen is calmly accepted and with it a slow decline of morale, standards of leadership, and training. At the end of the last war the British Army had almost everything it needed except enough battalions of the highest quality.

Battalion commanders should be relieved of all responsibility for tasks which can be done by other arms so that they are free to concentrate upon the handling of rifle companies. The best possible equipment should be provided to save infantry casualties and to maintain their morale and efficiency.

Broadly speaking, current theory is that the Divisional Regiment of the Royal Armored Corps shall be used defensively, while regiments of an independent armored brigade are employed to support infantry attacks. It is difficult to believe that cavalrymen will abide by this ruling in battle, for it smacks of trade union restrictions at its worst.

There must be more armor in the division, although not necessarily to engage enemy tanks. Heavy and medium gun tanks are required to destroy enemy armor, using such tactics as they see fit. However, there is also a need for light tanks operating primarily in an anti-infantry role. Thus *Comets*, or even *Cromwells*, would be most useful in a rear-guard or screen, or in a counterattack or counterpenetration role. They should also be used to cover an obstacle by day so that riflemen could withdraw to the rear to rest and reorganize.

There are more soldiers in a field regiment than in an armored regiment, and yet they operate only 24 guns as opposed to 60 tanks. If a sum is calculated to show weight of metal delivered per minute, the comparison is even more unflattering to the field regiment. If the rate of fire of artillery equipment were double, the same number of shells could be delivered by roughly half the number of gunners. Some flexibility would be lost, but deployment, the production of fire plans, and large concentrations of fire would be speeded up, because there would be fewer vehicles to move about and fewer command posts through which to pass orders.

The headquarters of the light regiment will seldom be fully employed in battle and is superfluous, because one gunner colonel could command all field and light units normally affiliated to a brigade. A countermortar staff and some locating devices might also be placed under his command.

Field artillery has little effect against armored vehicles, and so medium guns should be incorporated into the organiza-

tion of a division designed for mobile warfare.

The Royal Engineers have persuaded the rest of the Army that there are always too few sappers. In fact, a division is seldom delayed as much by a lack of sappers as by a shortage of good riflemen. However, there should be more engineers, and they should take over responsibility for all the assault pioneer platoon tasks, which cannot be done by well-trained infantrymen.

It is generally agreed that there are too many administrative troops in a division, and yet they are tolerated. When a division is deployed for battle, there may be 2,000 vehicles and their drivers in the administrative area, each of which average about one journey of 20 miles per day.

The infantry may be exhausted after only a few days' fighting, and then it becomes necessary to move into reserve not only the battalions, but also a vast cavalcade of craftsmen, laundrymen, and butchers, who have barely settled into their billets and begun work. This organization must be faulty.

The Royal Army Service Corps (RASC) Column has more vehicles than are necessary to supply a division when it is resting, and yet too few to maintain it when it is preparing to attack or defend a position or is involved in mobile warfare. The day-to-day requirements of formations fluctuate tremendously, and, therefore, all RASC transport should be centrally controlled by corps headquarters so that it can be most economically employed.

Similarly, all workshops should be under corps control, so that their work is less frequently interrupted by moves, and all supplies should be held centrally instead of in divisional field parks. Urgent demands for spare parts could be met by a frequent delivery service to forward areas, using helicopters when these become available.

A division must have its field ambulances, mobile repair and recovery sections, and sufficient service troops to man delivery points for ammunition, gasoline, and supplies. However, all the other administrative units now in the infantry division should be put under corps control.

The reduction in the number of service units in the division should be reflected in the service representation at divisional headquarters, because administrative planning and control would be exercised largely by corps headquarters. It should, therefore, be possible to dispense entirely with rear divisional headquarters and effect a large saving in Signal Corpsmen, camp staff, and vehicles.

The Light Division

The two preceding sections of this article have described the type of forces which will be required in a future war and the faults in the present organization. Opinions will differ as to the exact composition of a standard division for employment in northwest Europe in a future war, but it has been shown that the division should have more armor, motorized infantry, fewer gunners, more sappers, and the minimum number of divisional administrative units. One organization, incorporating these requirements, is set out below, and is followed by some explanatory notes:

Divisional headquarters—Main and Rover Group (or tactical).

One armored brigade consisting of one armored regiment—heavy and medium gun tanks; two light armored regiments—light tanks.

Two motor brigades each consisting of three motor battalions—each consisting of four motor companies and one machinegun company.

Divisional artillery consisting of headquarters—including air observation post flight and counterbombardment staff; 2 field regiments—quick firing 25-pounders, and 4.2-inch mortars; 1 medium regiment

—24 self-propelled medium guns; 1 light antiaircraft regiment.

Divisional engineers consisting of one plant squadron; two engineer regiments—each, one assault vehicle Royal Engineers or flail squadron and two field squadrons.

Administrative troops: Royal Army Medical Corps—three field ambulances and helicopter evacuation; Royal Army Service Corps—personnel for ammunition, gasoline and supply points, a stores distribution point, and a defense stores park; Royal Electrical and Mechanical Engineers—mobile repair parties, recovery sections, and stores distribution point; Provost—one company; postal unit.

The task of the armored regiment is to destroy enemy tanks, but no restrictions are placed upon its mobility or its tactics—it is *not* a divisional regiment of the Royal Armored Corps.

The light armored regiments are designed to work closely with motorized infantry, and will have four main tasks: first, to cover an obstacle by day; second, to afford antitank protection to infantry battalions; third, to provide the nucleus of rearguards, advance guards, and local counterpenetration forces; and, fourth, to support infantry at night. They should be equipped with light tanks carrying two machineguns and an effective antiinfantry gun, which is no less effective against tanks than the present 120-mm recoilless gun. The tanks will require infrared, or some other night-fighting equipment, which will enable them to engage enemy infantry at night. As an interim equipment, the *Comet* with CDL searchlight would be acceptable.

The infantry is completely motorized so that it can work in close cooperation with tanks in all phases of war, and have some cover from the effects of an atomic explosion when on the move. Tracked armored personnel carriers are not an economic proposition and so battalions should be provided with *Saracens*—the armored personnel carrier (wheeled). Four *Saracens* would be needed to carry a platoon and about 52 for the rifle companies of a battalion. One *Saracen* per platoon should be fitted with equipment to facilitate rapid movement across country, observation, and aimed small arms fire at night.

The battalion is stripped of the nonessential platoons of the support company to allow the commanding officer to concentrate upon the training, morale, and tactical handling of the rifle companies. The machinegun company, of 12 guns, will be primarily responsible for defense by day, in conjunction with light tanks and artillery. This will allow the rifle companies to rest by day, so that they are fresh for fighting at night, when they are indispensable.

This reorganization saves about 100 men per battalion but increases the number of vehicles by 25. The extra vehicles will significantly increase the efficiency of the battalion and will be balanced by reductions in the number of vehicles in other parts of the division.

Five principles govern the organization and equipment of the artillery. First, all field branch units normally in direct support of a brigade are under one commander; second, the rate of fire of guns is doubled, so that the number of men and vehicles required to produce the same number of shells is nearly halved; third, all guns are self-propelled equipment with overhead cover providing protection against atomic explosions; fourth, the range of guns and mortars is increased so that more guns can be brought to bear on any given target; and, fifth, armored regiments are supported by medium guns, which are effective against enemy armored vehicles.

Each motor battalion will be supported by four quick-firing 25-pounder guns and six long-range 4.2-inch mortars, which will be under command of one battery commander. The field regiment will have three

such batteries and the staff and equipment for countermortar work, including mobile radar sets. These sets might be developed from the night fighter's aircraft interception equipment. They should be fitted onto a light tank chassis, so that they can be sent forward to detect, and direct fire onto, enemy vehicle movement at night, or through smoke. It might seem that the battalion is inadequately compensated for the loss of its six 3-inch mortars. This is not so, because, if the heavy mortar is given an extra 2,000 yards' range, more mortar troops will be within range of targets on a battalion's front.

One medium regiment of three batteries is provided for the support of the armored brigade. It will include equipment for counterbattery work and mobile radar stations, as in the field regiments.

The light antiaircraft regiment is organized as at present, but equipped with self-propelled guns mounted in a plastic cupola, to give the detachment protection against heat, blast, and radiation.

This reorganization should result in a saving of at least 300 men and 100 vehicles in the divisional artillery.

Each engineer regiment has one armored squadron, with two troops of flails and two troops of assault vehicle Royal Engineers. These are primarily required to lay mines under artillery and small arms fire; they might tow an armored sled, carrying 150 mines which could be laid through a plough attachment.

Implications

The light division has been designed to defend an 8- to 10-mile front in average north European country.

It is visualized that three motor battalions and one light armored regiment might be deployed in the covering force, each battalion or squadron group having a frontage of 4,000 to 6,000 yards. A battalion group could then be deployed with two motor companies, half its tanks and most of its machineguns forward along the obstacle, and two company or troop groups in reserve for counterpenetration tasks.

The armored regiment, with some motorized infantry, should form the divisional counterpenetration force, because the light armored regiments are not designed for tank versus tank fighting. The second light armored regiment and the rest of the infantry would then form the divisional pivot force, holding ground covering likely approaches.

The light division is more suitably equipped than the infantry division for an advance or withdrawal in open country, and for an attack in conjunction with atomic missiles, but it lacks sufficient infantry for fighting in forests or mountains. It is, therefore, necessary to maintain some infantry divisions, which should also be equipped and trained for airborne or helicopter-borne operations.

Built-up areas will be a special problem. Cities will be dangerous to hold in strength, because they are an attractive atomic target, but, if it were desirable to supplement battalions holding a city, it should normally be possible to organize effective Home Guard units in northwest Europe. It will seldom be profitable to attack a city because it will be easier to force a route around the area than fight through the debris left by an atom bomb.

There are sufficient engineers in the division to make villages and small towns into major obstacles for the enemy, and, if necessary, sapper squadrons could supplement infantry units holding such areas.

It is appreciated that neither the infantry nor the light division will be able to offer prolonged resistance to a major attack supported by atomic missiles, but the virtue of the light division is that it will be less vulnerable to "atomization" and more able to delay and harass the enemy. However, a corps commander must have reserves available to reinforce forward units astride the enemy's main axis of advance.

These resources must be primarily armored units, because they will probably be required to move across country, under the threat of heavy air attack, and because the enemy's ground forces are most likely to be tank or mechanized divisions.

A corps might, therefore, consist of two light divisions, an armored division and one independent brigade.

During recent years the armored division has had to be misemployed on tasks which the infantry division could not undertake, because its fighting units were unsuited to mobile warfare. However, as part of an armored corps with light divisions, the armored division could be reduced to only four armored regiments, with two motor battalions, supported by two medium self-propelled regiments, and an engineer regiment.

The independent brigade will be required either to cover a relatively unimportant part of the front, or as a corps counterpenetration force, or as a "pivot" for the armored division. It should, therefore, consist of two motor battalions and a light armored regiment, supported by a field artillery regiment and an engineer regiment.

There would be no requirement for independent armored brigades and army groups Royal Artillery, because sufficient armor and medium artillery are available within formations.

The corps commander would be even more involved in the tactical battle than in recent wars, because he would probably be the lowest commander authorized to employ atomic missiles and he would control powerful armored reserves. The effective use of both of these would depend largely upon timing and the rapid transmission of information and orders to and from corps headquarters.

Corps headquarters will also exercise more control over administrative planning and execution which will facilitate the regrouping of brigades within divisions to meet particular tactical situations. Thus, in defense, a major enemy attack might be canalized by pressure exerted by groups of tanks and infantry from neighboring divisions. Providing that service units were concentrated under corps command, such regrouping would not present major administrative problems.

Success in battle must always depend largely upon the morale and training of the infantry. However much support they are given, they will always have the most arduous and most dangerous task in the division. In the light division there are fewer infantry battalions than in the infantry division, so it becomes more important than ever to maintain their quality. This cannot be done if they are subjected to the prolonged strain and the casualty rate that has been considered normal in the past. Therefore, complete battalions must be trained and held in reserve to replace units when they have spent a certain period in action or suffered, say, 20 percent casualties. If relief battalions were trained on the scale of 1 to every 5 units in action, it would allow battalions to be withdrawn at regular intervals for retraining and for the "rotation" of officers and noncommissioned officers. Junior leaders should be treated like Royal Air Force pilots and periodically sent to training units for a rest before returning for another "operational tour."

It will be possible to provide the manpower for relief battalions because improved equipment and organization will substantially reduce the number of men required in the forward areas and the casualty replacement rate.

An armored corps of two light divisions, a small armored division, and an independent armored brigade should be able to defend a front of 16 to 20 miles in Europe and would consist of 11 armored regiments, 18 artillery and engineer regiments, and only 16 small infantry battalions.

It is believed that in a war against

Communist imperialism all our ground commitments in Europe, the Middle East, and the Far East could be met with seven armored corps and two infantry or airborne corps. The manpower for such a force, with relief battalions and casualty replacement, could be found without conscripting men over 25 years old for "teeth" arms and over 30 for administration units. This would enable older men to concentrate upon production and civil defense for which they are better suited; men over 30 are generally of limited value in the forward areas unless they are volunteers or professionals.

Some of the proposals in this article may seem controversial until it is realized that the light division is practically the equivalent of half an infantry division plus an independent armored brigade, with the companies motorized. The rationalization of the artillery and the administrative services is designed to save manpower and vehicles to give to the infantry.

A small armored division and an independent brigade have the same number of fighting units as the present armored division.

Conclusions

Large concentrations of infantry will be most vulnerable to "atomization," particularly during a conventional attack or in the forward areas of a defensive position.

A major attack is most likely to be carried out by mechanized forces, advancing through areas neutralized by atomic bursts.

The defense should be conducted by groups of motorized infantry and tanks, deployed to cover an obstacle belt and to defend important tactical features.

Infantry should be reserved for essential tasks, particularly night fighting, so antitank defense, mortar fire support, and engineer assistance should be provided for battalions by other arms. However, there should be more machineguns in a battalion to reduce the number of riflemen required in forward defended localities by day.

The tactics of medium and heavy gun tanks should not be restricted in any way. Additional light armored regiments should be provided to cooperate closely with motor battalions in anti-infantry and local antitank protection roles. Tanks should be fitted with equipment to increase their effectiveness at night.

The artillery should be reorganized so that all units normally affiliated to a brigade are under one commander. All guns should be mounted on a self-propelled chassis, with overhead cover. The rate of fire of field guns should be doubled and all equipment, particularly mortars, should have a longer range.

The number of engineers in a division should be doubled, but they should undertake the tasks presently done by assault pioneer platoons. Engineer regiments should include an armored squadron of flails and mine-laying equipment.

The number of administrative units in the division should be reduced to the minimum, and in particular all RASC transport, Royal Electrical and Mechanical Engineers' workshops and the ordnance field park should be under command of corps headquarters. Rear divisional headquarters should then be eliminated to save manpower and vehicles.

A light division, organized to incorporate these recommendations, would be able to defend wider frontages than the present infantry division, and would be better suited to carry out an advance, a withdrawal, and an attack in conjunction with atomic missiles.

The light division would also be able to perform some of the tasks for which the armored division is presently organized, so the latter could be reduced in size.

The increased mechanization of the Army would considerably reduce the number of men required to meet our probable commitments in a future war.

BOOKS OF INTEREST TO THE MILITARY READER

COMBAT SUPPORT IN KOREA. By Captain John G. Westover. 254 Pages. Combat Forces Press, Washington, D. C. $5.00.

BY LT COL SAMUEL G. KAIL, *Inf*

Combat Support in Korea is a collection of interviews with members of all the arms and services except infantry, artillery, and armor. It is well written, contains an average number of illustrations, and is replete with names, units, places, and dates. Military personnel "who were there" and undoubtedly encountered some of the same problems, or who may have wondered why certain things were done or happened as they did may find some of the answers in these interviews.

Merely retelling a story seems to be a shallow approach, and as a result the book leaves the reader with many unanswered questions. There is no way of telling whether the solutions used or the actions taken in certain situations are accepted United States doctrine, or whether they were "field expedients" that just happened to succeed. There is no attempt to differentiate between stories that indicate good or bad actions. Too many stories are concerned with just one commander's approach to certain situations with no consideration being given to the effect his actions may have had on the larger effort.

One announced purpose of the book is to put into the hands of the junior officer some of the experiences gained on the battlefields of Korea so that he will better understand the missions and functions of the various services. While in a sense this is done, it is not certain that the experiences presented are those that the junior officer should remember.

BLACKBURN'S HEADHUNTERS. By Philip Harkins. 326 Pages. W. W. Norton & Co., New York. $3.75.

BY LT COL WILLIS B. SCUDDER, *Arty*

In October 1941 First Lieutenant Donald Blackburn arrived at Fort McKinley, Philippine Islands, and was assigned as an instructor to the 12th Infantry Philippine Army. By April 1943 he had taken to the Philippine jungle, there to embark on a unique chapter in the history of guerrilla warfare. This is the story of his experiences as a fugitive from Japanese military forces and as a part of an active and effective guerrilla movement.

Military readers will recall familiar names and places as the experiences of Blackburn, the guerrilla, unfold. At first the mere problem of existing faces Blackburn and his companions. Later their guerrilla force begins to take shape; the process is slow and requires great patience. Through it all runs the thread of the Philippine people, the assistance they offered to the fugitive Americans in the face of Japanese threats, and their participation in formation of the guerrilla forces which were in being when United States forces arrived in the islands for their reconquest in 1944.

A book that all will find well worth reading, for military readers it may serve as a primer on the day-to-day problems of guerrilla operations.

ESSENTIALS OF MILITARY TRAINING. 905 Pages. The Military Service Publishing Co., Harrisburg, Pa. $5.00.

BY MAJ JOHN J. EARLEY, *Inf*

This volume is an authoritative and comprehensive text covering drills and ceremonies, discipline, military courtesy, customs, orders, leadership, first aid and military sanitation, organization, weapons, map reading, teaching methods, combat training, and small unit tactics. It has been revised to bring it up to date at the time of its publication with the latest Department of the Army training literature and administrative changes. The latest Infantry School teachings in tactics, weapons, and techniques have been included. This book should prove invaluable to the company grade officer or to the Reserve or National Guard officer slated for a tour of active duty.

THE FORGOTTEN LEADERS OF THE REVOLUTION. By Howard Swiggett. 284 Pages. Doubleday & Co., Inc., New York. $4.00.

BY LT COL THOMAS O. BLAKENEY, *Armor*

The author is well qualified to write of this period. His other books of American history are well known. His endeavor is to "humanize" our early leaders and make the patriot leaders appear as they really were with "hands, organs, dimensions, senses, affections, and passions."

This book portrays these "forgotten leaders" as real members of the human race. They had private lives, some scandal, and "as with most of us, money, love, home, and a desire for security mattered most."

The Forgotten Leaders of the Revolution is enjoyable and entertaining reading. Military readers will find it contains a wealth of knowledge about our Revolutionary period.

FLORIDA FIASCO. By Rembert W. Patrick. 359 Pages. University of Georgia Press, Athens, Ga. $5.00.

ATOMIC WEAPONS AND ARMIES. By F. O. Miksche. 222 Pages. Frederick A. Praeger, Inc., New York. $5.00.

BY LT COL FRANCIS R. SULLIVAN, *CE*

This book attempts to summarize the historical paths upon which the present-day Western armies have developed. For some readers the author's analysis develops the thought that the success of the Western armies in these wars was accompanied by an overwhelming matériel superiority. This superiority was so quantitatively overwhelming as to almost preclude qualitative comparison of the antagonists. Colonel Miksche's analysis of World Wars I and II operations supports Liddell Hart's statement that:

Except for a temporary reverse in the Ardennes in December 1944, it has fostered a double illusion in superficial minds: that attack proved superior to defense in World War II and that our troops were superior to the German.

Colonel Miksche analyzes tactical atomic war based on the World War II record of actions of the German, British, and French, and superimposing on them the effect of the use of tactical atomic weapons. His effort in this analytical improvisation is to illustrate the unlikelihood of there being a possibility for highly mobile warfare in an atomic era.

Miksche believes that tactics, strategy, and army organization in the West are founded on an underestimation of the importance of the human factor in future wars.

At present the Western Powers are basing their strategy on bombs that are too big and on armies that are too small, whereas the East has both at its disposal —the big bombs as well as the big armies.

THE UNSEEN AND SILENT. Translated from the Polish by George Iranek-Osmecki. 350 Pages. Sheed & Ward, New York. $4.50.

Subscriptions to the MILITARY REVIEW may be obtained by writing directly to the Editor, Military Review, Command and General Staff College, Fort Leavenworth, Kansas. In the following countries subscriptions will be accepted at the addresses listed below:

Argentina
Círculo Militar, Buenos Aires.

Bolivia
Director, "Revista Militar," La Paz.

Brazil
Biblioteca Militar, Ministério da Guerra, Rio de Janeiro.

Chile
Estado Mayor General del Ejército, Departamento de Informaciones, Santiago.

Colombia
Sección de Historia y Biblioteca del Estado Mayor General, Ministerio de Guerra, Bogotá.

Ecuador
Dirección de Publicaciones Militares del Estado Mayor General, Ministerio de Defensa, Quito.

El Salvador
Estado Mayor General de la Fuerza Armada, Departamento de Publicidad y Bibliografía, San Salvador.

Mexico
Escuela Superior de Guerra, Oficina de Divulgación Cultural Militar,
San Jerónimo Lídice, D. F.

Nicaragua
Dirección de la Academia Militar, Managua.

Peru

Air Forces
Ministerio de Aeronáutica, Academia de Guerra Aérea, Lima.

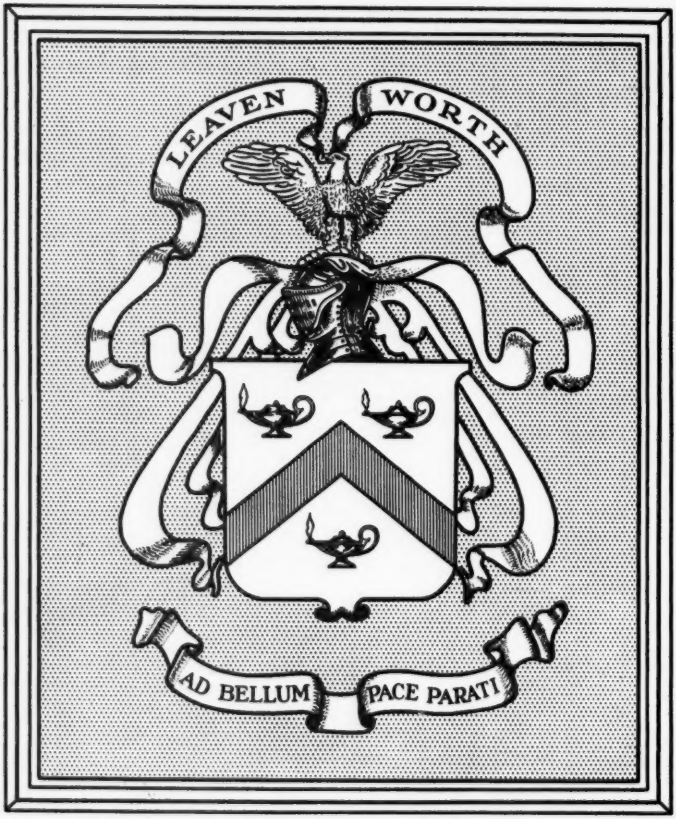
Ground Forces
Ministerio de Guerra, Servicio de Prensa, Propaganda y Publicaciones Militares, Lima.

Portugal
Revista Militar, Largo da Anunciada 9, Lisboa.

Uruguay
Biblioteca de la Inspección General del Ejército, Montevideo.

Venezuela
Negociado de Publicaciones de la 2ª Sección del Estado Mayor General, Ministerio de la Defensa Nacional, Caracas.

The MILITARY REVIEW and the Command and General Staff College assume no responsibility for the factual accuracy of the information contained in the MILITARY NOTES AROUND THE WORLD and the FOREIGN MILITARY DIGESTS sections of this publication. The items are printed for the purpose of stimulating discussion and interest, and no official endorsement of the views, opinions, or factual statements is to be implied.—The Editor.



The Army Library
Department of Army
Room 1-A-522, The Pentagon
Washington, D.C.

DISTRIBUTION:

ACTIVE ARMY (overseas distribution only):

OS Maj Comd (50); Base Comd (10); Armies (25); Corps (10); Div (10); Brig (5).